### **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



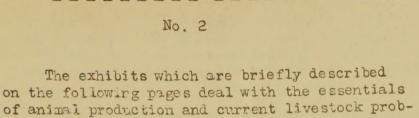
United States Department of Agriculture

SUMMARY OF

### LIVESTOCK EXHIBIT

lems and conditions under the following cap-

tions: -



RECEIVED

\* AUG > 7 1923 \*

6.8. Department of Assessment

Better Feeding Equipping a Livestock Farm Crops for Livestock Utilization of Feeds Reduce Production Costs Wool and Warmth Beef Production Horse Production Pork Production Meat and Ita Uses Meat Production Efficiency of Purebreds Animal Health Safeguards Livestock Welfare Livestock Statistics Market Grades and Standards Market Information

Much of the exhibit material is centered around areas where well-balanced systems of live-stock farming are practiced. The Corn Belt and some adjacent areas have, therefore, been given special attention because of the excellent results obtained from the systems of livestock farming which are followed in those sections.

Each subject is treated in a booth 13' wide across the face, 8' deep, tapering to a width of 8' at the back. Each section of a booth is 3' long and 4' high. The booths are 7' high.

40 Yourself

TITIBER ROUSE EXIS

5 . 5 %

ball wash of eight or going stated off all more and the form of th

and and a land of the second o

Mack of the orbits abords to centeral is content.

sroud dishe form held colored trabuse is live.

stock thrain, we proceed the Corn bits of any stock adams of the core bear dish special attention because of the excellent recent swits obtained from the execute of liveture.

Enroleg which are tollowed in those sections.

Fred cauged to broated to a booth 15' other scrape the face, d' doop, tagering to a sont of a 8' at the cast, fach escript of a cost, to d' long and il bigh. The booth are 7' otge.

#### "BETTER FEEDING."

This booth urges a study of modern feeding methods to get the best results with livestock. It points out particularly the great advantage to be obtained by the livestock man if he will study in advance his feeding problems and use the right feed at the right time. Such a system saves feed bills and grows better stock.

Not only must the right kind of feeds be fed, but they must be supplied in the correct proportions. The balanced ration is the most economical one. Corn should always be supplemented with protein feeds, even when there is a large corn crop and corn is cheap. Statistics show that cheap-corn years are usually followed by heavy losses of pigs, because insufficient protein feeds have been used by a great many farmers. In hog feeding, the self-feeder and the hay rack are the most economical means of providing sows and growing pigs with sufficient body-building proteins. Plenty of fresh water and lots for the brood sows that provide exercise are as important as proper feed.

Throughout all feeding work, it should be remembered that as young stock makes the most economical use of feed, an effort should be made to get the animal ready for market as quickly as possible.

The best feeding practices can not achieve the best success unless the animals to be grown and fattened are of good quality. When selecting feeders it should be remembered that good quality indicates good feeding ability. Good breeding practice and good feeding practice go together.

An excellent example of the benefits to be derived by the judicious use of the proper feed at the right time is given by the results of investigations by the Department with flushing of ewes to increase the lamb crop. The results of six years' experimental work show that 100 flushed ewes produced 148 lambs, while 100 unflushed ewes produced only 128. The flushing should begin at least two weeks before breeding and continue until conception. Ewes should gain at least seven pounds during the flushing period. Fresh grass pastures, soy beans and cowpeas are excellent flushing feeds. Mixed grain or oats should be used when pastures are dry and fresh foliage is not available.

It is possible to give but a few points on better feeding practices in an exhibit of this nature. Persons desiring assistance with their feeding problems are invited to write to the Department for more detailed information.

## UNITED STATES DEPARTMENT OF ACRICULTURE

#### " DESIGNATION OF THE PARTY OF T

the state of a content painted around to plate a segme at one at the court of the c

Throughout all feeding work, it should be remembered that as young stock names to most seconditively use of feed, an offers charle on mane to get the animal ready for market as giftedly as postale.

The best feeding practices can not ecuteve the nest ancient onless the enimals to be grown and fattened are of good quality findicates actorist free re to should be remumbered that good quality indicates good freeling shilley. Good breeding gractice and good feeding practice or together.

An excellent example of the right than is given up the justcrous ser of the proper feel of the right than is given up the results
of investigations by the Reportment with fluoring of sees to increase
the land crop. The results of six years' experimental erre about that
low flushed ever produced lit is be, while 100 unfillent was recome
the ideal flushing should topin at least two weeks as one creciles
and continue writh compeption. Nece second gain at least solven pounds
turing the flushing period. Erran grain or less acts of the case
which pastures are dry and fresh follows is not available.

trees in an exploit of tota makers. Persons assiring star dunce styr aller or teriors at a sure attraction of the file of teriors are the tree to the Lagartanes for ante attailed information.

486

### "EQUIPPING A LIVESTOCK FARM."

Good buildings and equipment save feed and labor. This feature in livestock farming, so often overlooked, is emphasized by pictures and brief comments. Drawings and blueprints of farm homes, cattle barns, horse barns, sheep barns, hog houses, and poultry houses, are shown. Duplicates of these and others of different design may be obtained from the Department of Agriculture.

The panel entitled "Clean pens--Greater gains" pictures a make-shift hogpen which has been thrown together by placing some old fodder and straw on a frame built of fence rails. The type of hog is shown that is usually found living in such quarters. Even well-bred hogs of good quality can not be expected to make the best gains in dark, damp, insanitary houses. Contrasted with this is an illustration of clean and comfortable hogpens provided with dry, clean houses, self-feeders, automatic fountains, shades and wallows. The type of hog that belongs with such equipment is pictured in contrast to the one which shows lack of proper care.

A group of inferior farm buildings with rubbish scattered about the yards, is contrasted with up-to-date buildings. Inferior buildings are wasteful of feed and labor, unsightly, and insanitary, and harbor disease. Careful choice of building sites and good substantial buildings save time, labor and feed, protect the health of livestock and make farm life more attractive.

Consult the Department of Agriculture for plans of buildings that are convenient, durable, economical, and attractive.

# SECTION TO PERSON AND STATE OF THE SECTION OF THE S

### "EVERT SOOTSTVII 4 DEPT INTEL

are licebook larrence, so often everlooked, is ementated by pretures and actor former, as often everlooked, is ementated by pretures and areas of ever occase, catelle care, now ever occase, and consider nowers, are seened, barrens of time as a modern of the end occase, are seened, includes of time others of different acestra may be not taken from the location of all formers.

dist mespen area and there there together gains' ristares a master of its mespen area and the street and a street and the street and the street and a street and a street as and a street as a street and a street a

the yards, is contracted that actually of the raction to pure and the yards, is contracted to the yards, is contracted to the pure actually and investigate, and investigate, and investigate, and investigate, and investigate, and investigate to the total actual total and investigate and investigate and investigate and total total total actual total total actual total total actual total actual total actual actual

evaluation to ensign to a terrorise of the plane of the community of the c

#### "CROPS FOR LIVESTOCK."

Corn, clover, oats and soy beans are the crops selected to illustrate the exhibit "Crops for Livestock." They are all successfully grown in the Corn Belt where a large percentage of our livestock is produced.

Corn is the most important crop in the United States, both in acreage and in value. The amount of yield is greatly influenced by the quality of seed that is planted. This is illustrated in the exhibit by pictures of two baskets of corn grown on equal areas. The basket from the area planted with good seed contains more corn and larger, bettershaped ears than the basket containing the corn grown from the poor seed. If the corn is to be fed to hogs, one of the cheapest methods of harvesting it is to turn hogs in the field and let them eat the corn from the stalks -- commonly called "hogging down."

Clovers make excellent feed whether used as pasture, as hay, or as soiling crops. Their high protein content make them valuable feed for growing animals, and a good supplement with corn. One ton of clover hay has a feeding value equal to 1-1/2 tons of timothy hay, 3/4 ton of shelled corn or 2/3 ton of wheat bran for fattening animals.

Oats is the standard grain feed for horses in most sections of the country, and is recognized everywhere as a good growing feed for all young stock. Oats is an easily digested feed and has a high protein content.

Soy beans is another crop that makes good hay and is becoming popular in the Corn Belt as a pasture crop. It can be grown on a wide range of soils, but inoculation is necessary when it is grown for the first time. Soy-bean hay contains a high percentage of protein and is highly palatable. Soy beans are usually grown with corn, when used for silage. Bulletins describing proper methods of handling the abovenamed crops and their use as feed for livestock, can be secured from the Department.

### QUITED STATES ITEMS TO A CRICULTURE

#### "CEOPS FOR LIVESTOCK."

Corn, clover, cats and soy beans are the crops selected to 11loctrate the exhibit "Crops for Livestock." They are all successfully
green in the Corn Helt mere a large percentage of our livestock is
produced.

Corn is the engt important drop in the United States, both in sorteage and in value. The amount of yield is greatly inflatment by the quality of seed that is planted. This is illustrated in the excipit by protures of two backets of corn grown on egon, reds. The backet from the area planted with good seed contains done coin and larger, better adapted cars than the brainet containing the coin down from the front seed. If the corn is to be fed to look an order the cheapest actuals of harvesting it is to burn nogo in the institute that the commonly called "no plant down."

Clovers make excellent feed whether made as pusture, as hay, or as soling erops. Their high protein contains make their basis selected for growing univals, and a good empired as out to the corn. One ton of clover has a freshing value oqual to 1-1/2 tone of empire and a model of the corn or 8/3 tone of enest brust for fivienting enterior.

Oats is the standard grain feed for horses in most sections of the country, and is recognized everywhere as a good product feed for all young stock. Oats is an edsily digested feed and has a high protest content.

Coy beans is another croy that culors good may and is seconding require in the Corn Belt as a pasture croy. It can se grown an a wraterance of soils, but indeplation is necessary when it is grown for the first time. Soy-bean hay contains a nich percentage of protesn and is nicely palatable. Soy beans are usually grown with corn, then used for silage. Bulleting describing proper mathods of natiting the acoveraged crops and their east as feed for itwo took, out os netured from the Legartment.

#### "UTILIZATION OF FEEDS."

In planning feeding operations the livestock feeder often wishes to know how much feed of different kinds is required to fatten a steer or a hog or a sheep, or a carload of either. The booth shows pictorially and graphically the approximate amounts of feed, and successful combinations of feed, that will fatten a carload each of sheep, hogs, and steers. They are as follows:

600 bushels of corn and 17 tons of hay will fatten 250 lambs weighing 55 pounds each, and make them weigh 80 pounds, or one double-deck carload.

450 bushels of corn and 2,750 pounds of tankage or fish meal will fatten 70 hogs averaging 100 pounds, to 200 pounds each, making one carload.

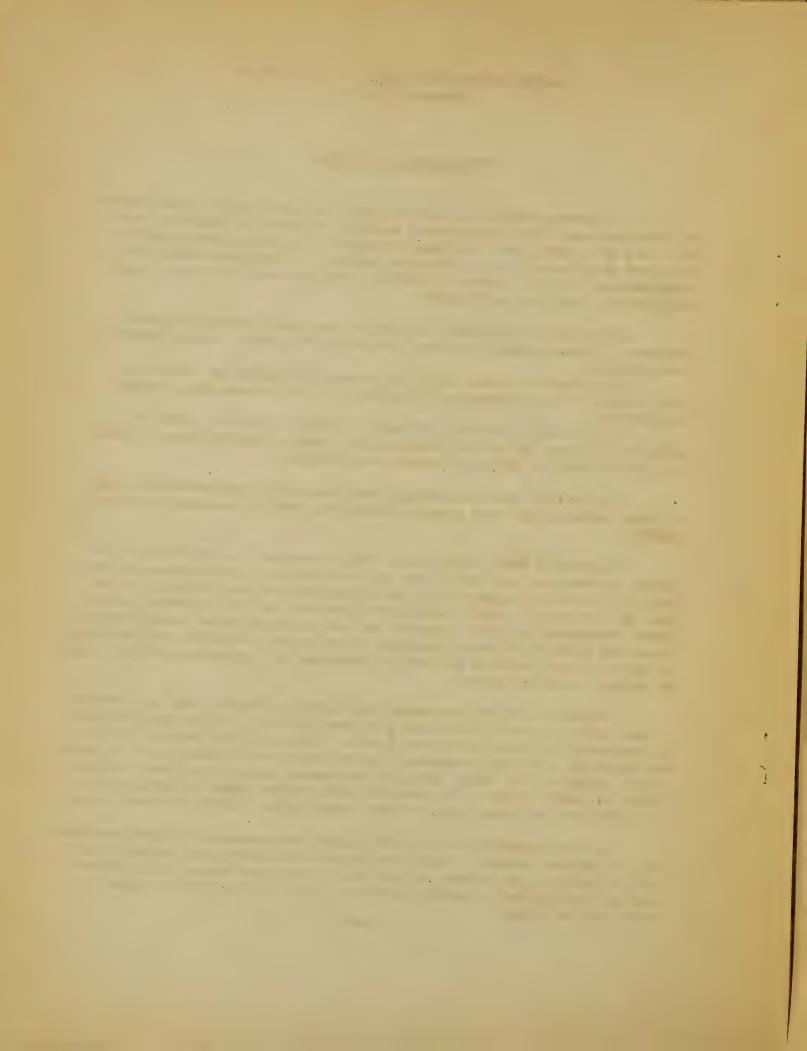
1,100 bushels of corn, 10 tons of alfalfa hay and 5 tons of straw will fatten 20 steers averaging 850 pounds, causing them to gain 325 pounds each in 180 days, making one carload.

The exhibit shows strikingly how livestock concentrate the bulk of farm products and thus greatly reduce the cost of transportation to market.

"Livestock Need Crops--Crops Need Livestock" is the title of a panel on which are set forth some of the benefits of well-balanced farming which involves maximum crop production and the use of crops on the farm by livestock. Such a combination produces an even distribution of labor throughout the year, permits the use of rough lands, saves surplus feeds and feeds that would otherwise go to waste, conserves the fertility of the soil, and reduces the cost of shipping the production of the farm to market, as noted above.

No matter how well-balanced the system of farming may be, however, it can not be successful without good crop yields. Proper crop rotation is necessary to obtain good crop yields. Two good Corn Belt rotations are shown by pictorial diagrams. For regions where winter wheat is grown a good rotation is: Corn; corn and soy beans; oats or soy beans; wheat; clover or sweet clover. For regions where winter wheat is not grown a good rotation is: Corn; corn and soy beans; oats; clover or sweet clover.

All recommendations for feeding and farm management practices must be of a general nature. Each farm presents an individual problem that must be analyzed and solved to fit its special conditions. The Department is always glad to answer questions that will enable the farmer to solve such problems.



### "REDUCE PRODUCTION COSMS."

Cost of production of livestock is influenced by many different factors. High production costs may be due to inferior quality of animals, faulty breeding methods, poor feeding practices, improper housing, umbalanced farm system, or insufficient size of business. The lowering of these costs is largely a question of management and in many instances more practical and less expensive methods of production can be used.

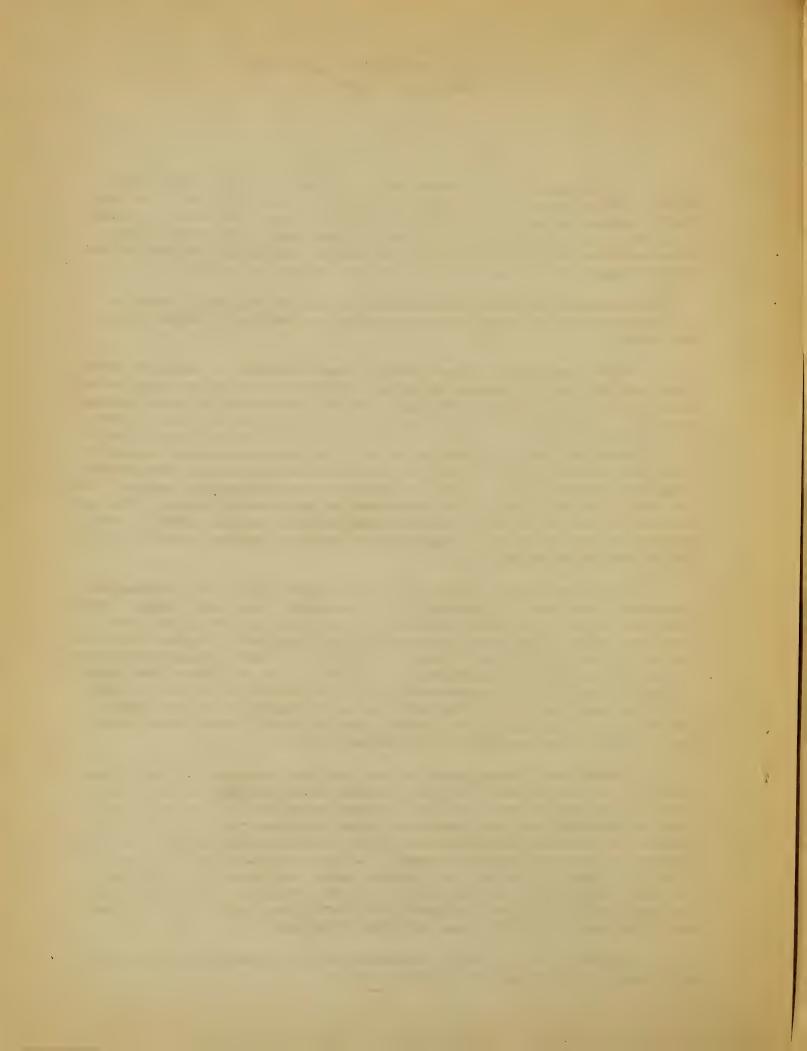
The exhibit illustrates desirable methods of handling livestock, and outlines good practices in the breeding and feeding of cattle, hogs, and sheep.

In the management of beef cattle, feeders should be raised on cheap land, and fattened in regions where corn is plentiful. On the range native grasses should be given opportunity to reseed themselves by proper grazing practices. An extra feed supply should be kept on hand for times of pasture shortage and for long winters. In the feed lot the equipment (and this applies with equal importance to all livestock management) should be practical and labor-saving, but not elaborate and expensive. For growing animals a liberal amount of protein should be provided in the ration. This can usually be supplied at the least cost in the form of legumes. The calf crop can be increased by eliminating from the herd all shy breeders, non-breeders and old cows, by having bulls in vigorous breeding condition, and by keeping the animals healthy.

In hog management, more attention is often paid to the feeding of fattening hogs, than to breeding sows. Inattention and carelessness during gestation and at farrowing often causes great losses. One of the most practical means of reducing swine production costs is to increase the number of pigs raised per sow. Sows of the brood-sow type should be selected for breeding. Where possible they should themselves be chosen from large litters. When the sow has farrowed, every effort should be made to save the young suckling pigs. Sows and pigs may be turned on pasture early, and the young pigs should be allowed access to a self-feeder where corn can be supplied as a supplement to the sow's milk.

Correct sheep management differs from the management of cattle and hogs only in the details. The net profits should be made as large as possible by keeping the ewes healthy the year around and in a gaining condition at breeding time, by discarding barren ewes and old ewes with broken mouths, by selecting vigorous rams of fixed type showing masculinity, and by careful attention during lambing. On the range care should be used in grazing in order to protect the grazing lands, and legume hays should be fed with cheap roughages where grazing is not available. Stemach worms increase production costs, especially on farms, and these should be prevented by pasture rotation and bluestone treatment.

Bulletins on the proper management of all classes of livestock may be obtained by writing to the Department.



#### "WOOL AND WARMTH."

The exhibit "Wool and Warmth" furnishes information of interest to growers, manufacturers, and the public. Wool varies a great deal in fineness, length, strength, and manufacturing value. The selection and breeding of sheep govern in large measure the fineness and to quite an extent the length and spinning quality, while the feeding, care, and health of the sheep are of vital importance in the production of heavy, strong, lofty fleeces useful in the manufacture of warm, durable, and attractive garments, robes, and blankets.

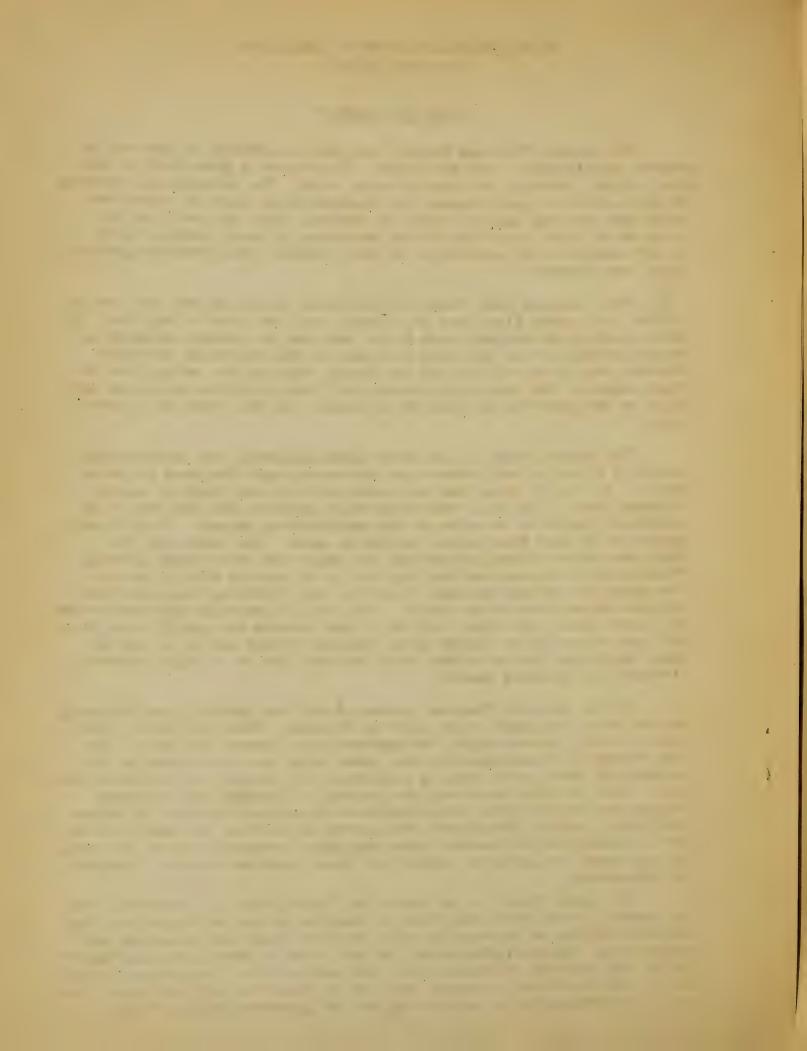
When shearing sheep their fleeces should be dry and the work done on a clean, well-swept floor free from straw, chaff or litter of any kind. The fleece ought to be clipped close to the skin and the shearer should avoid second cuttings of the same wool as fibers of good length are desirable. The next step is to roll and tie the fleece, wrapping the string first at right angles to the direction in which the fleece is rolled and second parallel to the direction in which it is rolled. One wrap each way is sufficient.

The fabrics shown on the center panel illustrate the suitings made from wool of half-blood fineness and overcoating made from wool of coarse grades. It will be noted that half-blood wool of good length is called "combing" wool. This is a trade term which indicates that the wool is of sufficient length to be combed in the manufacturing process. Wool of such length can be made into durable worsted as shown. The short wool from which the woolen suiting is made has the grade term "half-blood clothing." "Half-blood" indicates that the fineness is the same as that of the wool from which the worsted was made, while the word "clothing" indicates that the wool is too short to be combed. Such wool is generally made into woolen or flannel goods, therefore, worsted is more durable and usually more popular than the woolen or flannel goods when the worsted and woolen are of equal weight and the wools from which they are made are of equal fineness, strength, and spinning quality.

On the basis of fineness, prices of wool are quoted by the following grades, which are named in the order of fineness: Fine, half-blood, three-eighths-blood, quarter-blood, low quarter-blood, common, and braid. The word "blood" in connection with wool grade terms has no reference to the breeding of sheep but is used in connection with fractions to designate fineness. Fine and half-blood wool are produced by purebred and high-grade Merinos and Rambouillets; three-eighths-blood and quarter-blood by medium-wool sheep, such as Shropshires, Hampshires and Oxfords; low quarter-blood by the coarsest of medium-wool sheep and grade coarse-wool sheep, and braid by high-grade, or purebred, coarse-wool sheep, such as Cotswold, Lincolns, and Leicesters.

The grade "fine" is the finest and "half-glood" the coarsest of what is commonly called fine wool, that is, half-blood wool is coarser than the finest of Merino or Rambouillet wool, but finer than what we usually call medium wool; "three-eighths-blood" is the finest of medium wool, and "quarter-blood" the coarsest of medium wool; "low quarter-blood" is coarses than half-blood, but the finest of coarse wool, while "braid" is very coarse and "common" is intermediate in fineness between low quarter-blood and oraid.

- 7 -



#### "BEEF PRODUCTION."

The exhibit entitled "Beef Production" is based on an extensive survey being made by the Department of Agriculture and State agricultural colleges throughout steer-feeding sections in the States of Illinois, Indiana, Iowa, Missouri, and Nebraska. Several phases of beef production are being studied. The studies have involved approximately 20,000 steers each year for the last four years. This year's work will complete the study.

Cattle feeders in the Corn Belt usually either buy their feeder cattle direct from the range or at the large livestock markets in the Middle West. Most of the feeders are finished on corn and legume hay, or corn and silage supplemented with a protein meal. The kind of hay grown in the locality usually determines the ration used. The survey has shown that about the same number of steers are fed throughout this region by each method. In those areas where clover and alfalfa hay are grown abundantly, the standard ration is corn and clover or alfalfa hay. The legume hay supplies the necessary amount of protein. In other areas where the bulk of the hay is mixed hay, silage is included in the ration to supply the roughage, and cottonseed or linseed meal is fed as a supplement to supply the protein.

The following table shows the length of feeding period and amounts of feed to make the same amount of total gain on a feeder steer, under each system of feeding, as determined from this survey. The figures apply to steers around 2 years of age, weighing 850 to 900 pounds at the time of going on feed.

	Corn and	Corn, silage &
	alfalfa hay	cottonseed meal
Length of feeding period	. 146 days	185 days
Total gain	. 302 pounds	302 pounds
Daily gain	. 2.07 pounds	1.63 pounds

#### Feed consumed per steer:

Corn	pounds
Corn	pounds pounds
Silage       5,583         Straw       612	pounds

Information on feeding problems and other phases of beef production can be secured by writing to the Department.

#### "HORSE PRODUCTION."

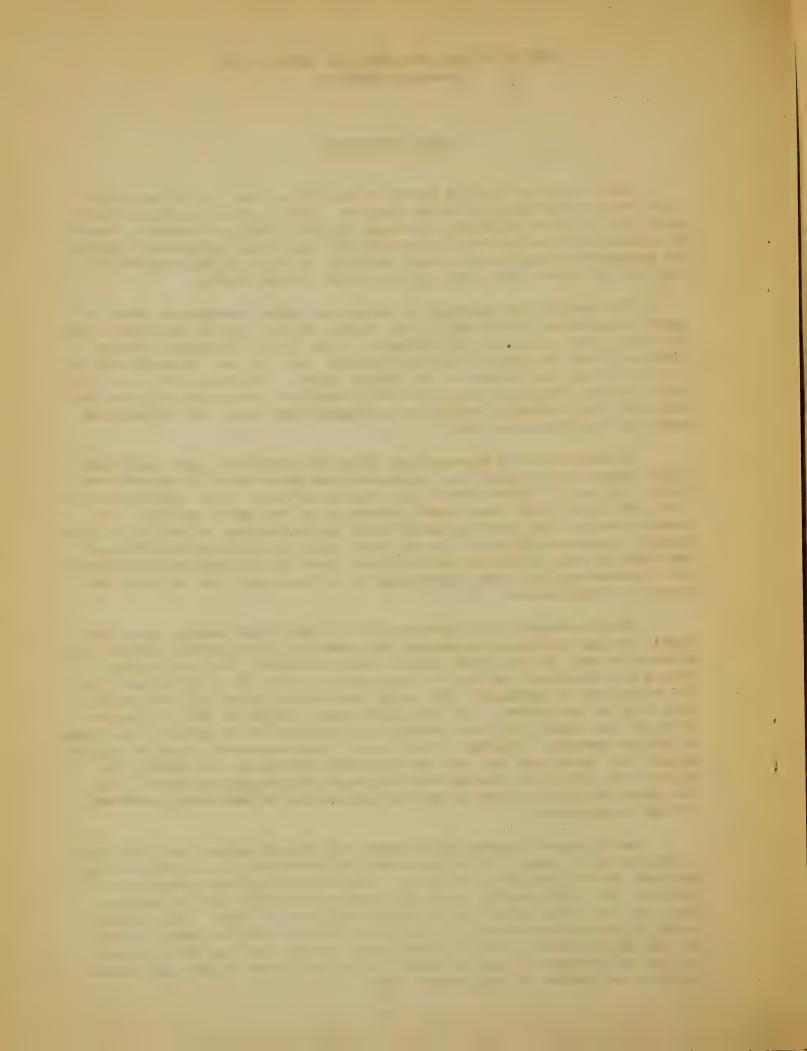
There is a need in the United States for production of horses and mules, especially those of better quality. Based upon 1920 census figures, about 200,000 fewer colts were produced in 1919 than were needed to supply replacements on farms alone. About 225,000 high-class animals are needed for annual replacements in cities, making a shortage in replacements of over 400,000 horses and mules in 1919 in the United States.

The surplus and shortage of horses and mules produced on farms is shown geographically on a map of the United States. In the area including the Middle West States of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Iowa, Missouri, Illinois, Indiana, and Ohio are produced most of the work horses and mules for the United States. Although most of our big draft animals needed in the cities and specialized farming areas come from this area, only a small surplus was produced above their own replacement needs in this region in 1919.

In the States of Kentucky and Tennessee where many good mules and light horses are produced, the production was about equal to replacement needs. In the 12 States west of and including Texas, where the horses produced are principally range stock, there was a very small surplus. Yet because most of the stock is undesirable, production may be said to be about equal to replacement needs. On the other hand, the production of horses and mules in the 24 Fastern and Southern States is only one-half that needed for replacements, and both farmers and city trade must look to other sections for replacements.

The Department calls attention to the fact that farmers might profitably produce replacements enough, in connection with general farming, to be able to sell off the older work animals each year. As local market values are determined by the city and eastern trade, it is important that the right kind be produced. The small undeveloped animal of poor quality is a drug on the market. The best brood mares should be bred to purebred sires of the right type, and feeding the youngster is of parallel importance to proper breeding. Pasture, which is a primary necessity, must be supplemented with grain and hay, and the colt kept growing at all times. Not only is the use of the non-salable roughages of economic importance, but the grain and hay produced in general farming may be profitably marketed through young stock.

As the market demands well-broken and trained horses that will last a long period of years, the colts should be broken at about 3 years of age and used on the farm for a few years. By this system these young horses together with the breeding stock will furnish the power for the average farm, and the young stock will be increasing in sale value. The maximum value of horses is at about 6 years of age and the surplus animals should be sold at this time. The well-bred horse or mule that has been properly fed and well broken is usually salable at a profitable figure, and should increase the income of the general farmer.



#### "PORK PRODUCTION."

The booth entitled "Pork Production" gives the essential points for raising swine economically. The important factors under the control of the hog raiser are the type of animal grown and the feeding and management methods used.

When bred to big-type boars, big-type sows in proper physical condition at the time of mating, and well red and managed during the gestation period will not only produce strong, vigorous pigs, but will have abundance of milk to nourish them properly.

Pasturage of good quality, shorts or wheat middlings and fish meal or tankage to furnish protein, with sufficient corn or barley to keep them in fair flesh, represent the feeds necessary for breeding hogs. Alfalfa, soy-bean or clover hay are valuable additions for winter feeding. It is important that breeding hogs be given daily exercise for the best results.

Any feeds supplied during 24 hours after farrowing are objectionable, and may be responsible for poor results with the newborn pigs. However, when feeds are again supplied they should be in small amounts and gradually increased to full feed within about 10 days; the sows readily use them to advantage. It should be kept in mind that sows sparingly fed can not give milk enough to make pigs grow as they should.

Even before the pigs are weamed they should have access to corn and shorts or middlings in self-feeders as a supplement to the sow's milk. As soon as they are weamed the pigs should be kept on full feed, either by self-feeder or by hand. By this system pigs grow continuously from the moment of birth to maturity. Suitable feeds, furnished to vigorous pigs of proper type, result in the production of hogs of market weight at about eight months of age.

"The profitable pig is the one that never stops growing from farrowing to market," is a good slogan for every hog raiser.

And the second of the second of

. 1

#### "MEAT AND ITS USES."

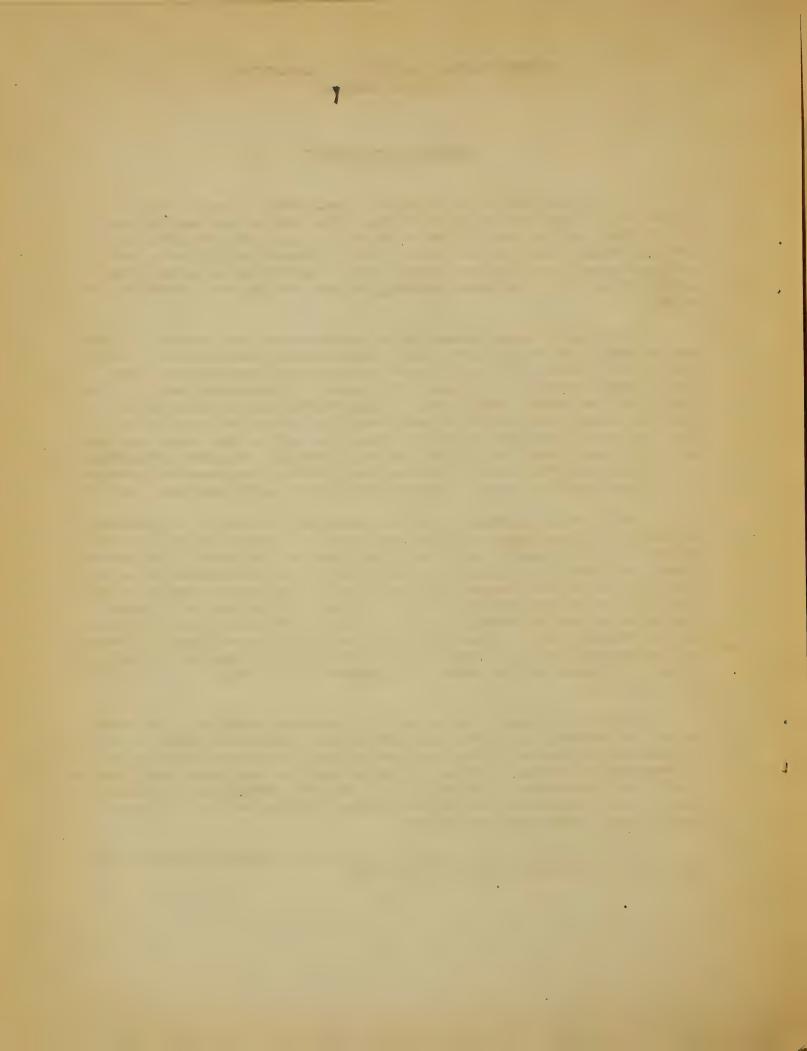
An education in the selection and preparation of meats can be secured by a careful study of the pictures and text in the exhibit entitled "Meat and Its Uses." The housewife who buys the meat often has no definite idea of the relative value of the different cuts of meat, and in most cases she can not tell a choice piece of meat from an inferior one until she has it on the stove cooking, or until it has been served on the table.

The cheaper chuck steaks from a choice carcass are generally superior to the higher priced porterhouse steaks from a common carcass. Therefore if the person who buys the meat for the family can recognize meat from a choice carcass at a glance, the problem of economical meat for the family will be greatly simplified. Illustrations are shown of cuts of beef and a magnified section of beef both from choice and inferior or common carcasses. Meat from a choice carcass is well marbled (desirable mixing of fat and lean), the fat is firm and white, and the lean has a bright red color; meat from a common carcass shows little or no marbling, the fat is dark and often yellowish, and the lean is a black or purplish red color.

Many people hesitate to purchase meat cut from the fore quarters of a steer, but these cuts are tender and palatable when taken from choice steers that have been properly grown and fattened for market. The greater purchasing power of a dollar is shown to be in the fore-quarter cuts of beef by a series of pictures of cuts of meat. The figures from which this comparison was compiled were reported by the U.S. Department of Labor, and based on average retail prices in 1922 in more than 50 cities of the United States. According to these figures, one dollar will buy 1.8 pounds of porterhouse steak, 2.7 pounds of sirloin steak, 3.1 pounds of round steak, 3.6 pounds of rib roast, 5.1 pounds of chuck roast, and 7.8 pounds of plate beef.

The center panel of this exhibit illustrates methods of preparing meats. A pot roast is shown with potatoes and vegetables, making a well-balanced meal, the meat being prepared in such a way as to preserve all flavors and nutrients. This method of preparing a meal saves both time and fuel. An illustration shows the use of left-over meats and vegetables in making meat salads; and another the making of sandwiches from cold meats which are as nutritious as hot meats.

Bulletins containing useful recipes for the proper preparation of meats may be obtained from the Department.



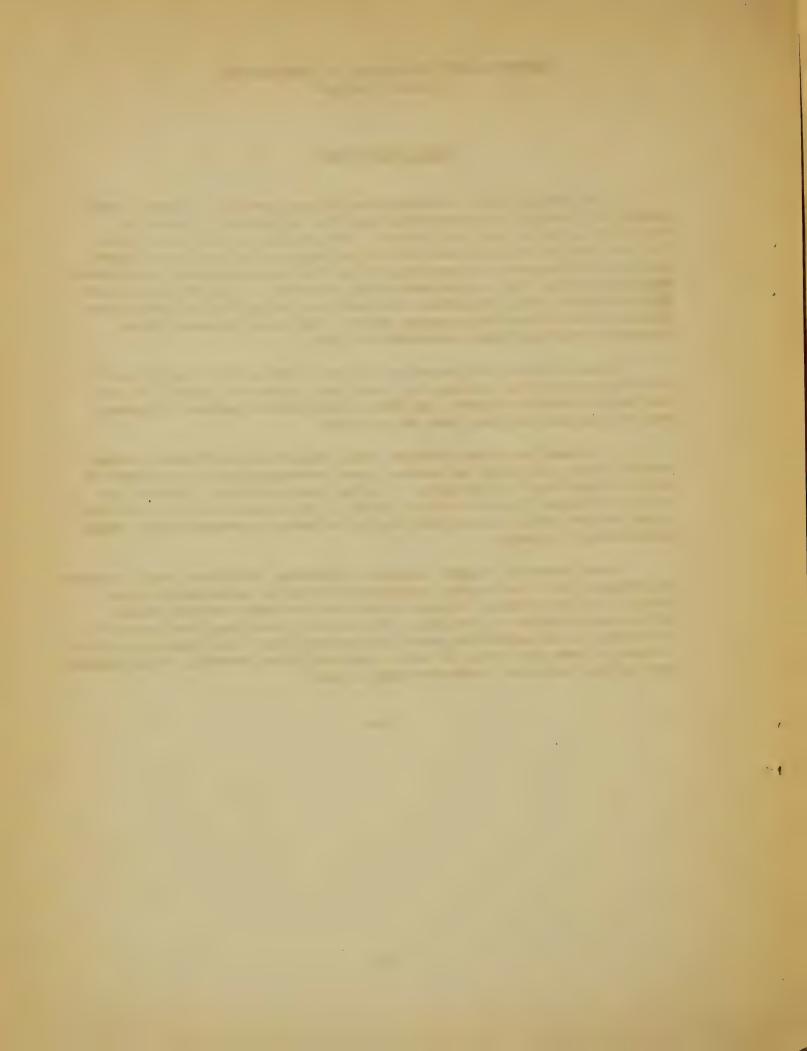
#### "MEAT PRODUCTION."

The average person seldom stops to consider the important part played by livestock in converting many farm crops and by-products, feeds not suitable for food for man, into edible, concentrated food. The utilization of such feeds as forage crops and by-products of the factory by livestock, is not only one of the fundamentals of economical meat production, but is the basis of a permanent system of agriculture. In addition to such feeds there is usually a large crop of the various grains which can not be consumed by man, and these are most advantageously utilized when converted into meat.

The 1922 corn crop exceeded two and three-quarter billions of bushels, or about 26 bushels for every man, woman and child. No one can eat 26 bushels of corn, but when it has been converted into meat any one can eat the meat that it produces.

The panel entitled "Pasture Helps Fill the Meat Platter" shows cattle, hogs, and sheep on pasture, busy converting grass into meat to add to the Nation's food supply. In the panel entitled "Utilize By-Products Through Feedlot Methods" these three classes of livestock are shown in the feedlot where they may be fed many by-products that would otherwise go to waste.

Meat contains a large amount of proteins, which are body-building substances, in a form easily digested and readily assimilated by the body. It also contains vitamins which are necessary for the normal growth and vitality of the body. Furthermore, meat supplies these food substances in an appetizing and concentrated form. A liberal proportion of meat in the diet tends to make a physically and mentally well-balanced race as well as a well-balanced agriculture.



#### "EFFICIENCY OF PUREBREDS."

Figures of the Department of Agriculture, based on actual results with 55,000 head of breeding stock on farms throughout the United States, show that the average superior earning power of purebred over common livestock is 40.4 per cent. This greater earning power is the result of many different factors. The purebred animal is able to make better use of a given amount of feed. The meat of a well-bred steer or hog is of better quality and brings a higher price than that of an ordinary carcass.

The dressing percentage of well-bred livestock is found to be greater than that of the average animal. Fewer animals required to make the same amount of marketable product enable the livestock man to save time, labor, and housing space. The offspring of purebreds have greater market value than the young of common animals. All these factors are reasons for the greater efficiency of purebreds, and good reasons why farmers everywhere should begin at once getting acquainted, first hand, with their advantages.

The superiority of purebreds is illustrated in the exhibit by a balance having at one end a pen of purebred stock, and on the other a pen of common stock. The purebred stock overbalance the common stock by 40 points as measured on the "Superiority" side of the scale.

Another panel shows a purebred boar which was slaughtered at the age of 3 years, 10 months, long before his value as a sire had passed. His carcass, which is shown dressed, weighed 1,005 pounds. This boar was too valuable to have been slaughtered in his prime. Farmers often fail to study the production records as well as the breeding records of their purebred males, not realizing that an older animal which has proved himself in his get may be much more valuable than a younger animal with a more promising pedigree.

Another panel shows a purebred calf which weighed 1,200 pounds at just a year old, illustrating the ability of well-bred stock to make rapid gains and mature quickly. A study made by the Department including large numbers of livestock owners in a wide range of States, showed that users of purebred sires are 98 per cent satisfied with them as individuals, and 99 per cent satisfied with their offspring. This is an excellent recommendation for those farmers who have not become acquainted with purebreds.

Department Circular 235 gives full information on the subject of the efficiency of purebreds.

#### "ANIMAL HEALTH SAFEGUARDS"

A colored map showing by counties the extent of bovine tuberculosis in the United States is one of the features of this portion of the exhibit. Tuberculosis infection is shown to be relatively slight in extensive areas. Only 0.6 per cent of the cattle are tuberculous in an area containing 46.4 per cent of the total area of the United States, and containing 41.2 per cent of the total cattle in the country. Less than 1.5 per cent of the area of the country has an infection of more than 15 per cent of the cattle. However, 4.3 per cent of the cattle, or 2,960,954 head are to be found in this area. Nearly five times as many tuberculous cattle are contained within an area of about 50,000 square miles as in another area containing more than 1,500,000 square miles.

A study of this map enables livestock owners to learn the sources of greatest danger, and they can use special precautions when buying their breeding stock. A study of the distribution of this disease among the cattle of the country also shows the nature of the task that confronts the nation in its campaign to eradicate this disease.

Tuberculous cattle spread the disease to swine. Hogs are infected by following diseased cattle, and by drinking milk from tuberculous cattle. Milk for hogs should be boiled if it is not from tuberculosis-free herds. The following figures show the losses due to tuberculosis, during the fiscal year 1922. These figures are based on Federal Meat-Inspection records;

Cattle	Slaughtered 7,871,457 39,416,439	Carcasses condemned 39,434 70,304	Parts condemned 60,441 666,787
Pounds beef lost (estimate Pounds pork lost ("	ated)		32 8

These figures can give but an idea of the total loss the nation sustains annually because of bovine tuberculosis. Animals affected with the disease can not make the best gains. The danger to human health is a further reason why tuberculosis of livestock should be suppressed.

The vigorous campaign being conducted by the Federal government and the various States for the eradication of this dread disease has resulted up to November 1, 1922, in 20,041 accredited herds in the United States, in which 435,941 cattle have been pronounced free from tuberculosis. This work is making satisfactory progress and it is believed to be possible, eventually to free the country of bovine tuberculosis.

### the street of the street of the

4

to a first of the second of th

The Control of the Co

#### "LIVESTOCK WELFARE."

The livestock-welfare work of the United States Department of Agriculture consists of experiments in the feeding and breeding of livestock, experiments in the prevention and control of insects, parasites and predatory animals harmful to livestock, and reporting information obtained in these experiments.

So far as possible these experiments are conducted at places in the United States where the conditions approach those actually confronting livestock farmers. This system of experimentation makes the results of greatest value to the livestock man. A large map of the United States is shown in the exhibit, and on it are indicated the points at which experiments are conducted, with a brief statement of the work at each point. Visitors are welcome at the various experiment stations and farms.

Proper sanitation on livestock farms is vitally necessary for the welfare of America's livestock. Careful breeding and careful feeding can not assure success unless the animals have clean, dry pens and houses in which to live. Another phase of this question is the danger to the health of the farm family. Some diseases of livestock are communicable to man. Pictures of clean and unclean quarters for hogs are shown.

A part of this exhibit deals with Federal meat inspection and shows clearly that extreme cleanliness is maintained in establishments having this service.

Meat Inspection is a service to stockmen as well as consumer. It enables stockmen to obtain information on the condition of their animals and points a way for the future production of healthy stock.

#### "LIVESTOCK STATISTICS."

Figures show that the United States has but one-sixteenth of the world's population, but it has one-sixth of the world's livestock, approximately as follows:

One-half of the world's 9,000,000 mules One-third of the world's 169,000,000 swine One-fifth of the world's 100,000,000 horses One-seventh of the world's 492,000,000 cattle One-ninth of the world's 465,000,000 sheep

Statistics show that the United States ranks fourth in the per capita consumption of meat. The following table shows the figures for the principal meat-eating nations of the world. (U. S. figure is a 10-year average from 1912 to 1921; other figures are prewar.)

Country Lbs.	meat	Country Lbs. me	eat	Country Lbs. meat.
Argentina	281	France	80	Norway 62
Australia		Denmark	76	Sweden
with to lead .		and white and a second	<i>j</i>	Particular to the first terms of
UNITED STATES	142	Belgium	70	Russia50
Canada		Netherlands	70	Spain
United Kingdom	120	Greece	68	Italy 47
Germany	115	Austria-Hungary	64	

A chart showing the trend of human and livestock population from 1850 to 1922 shows that human population has had the greatest increase, that the number of swine is the most variable, and that sheep show the greatest general decline. The relative positions of the curves in 1922 indicate more and more difficulty in supplying our ever-increasing population with sufficient meat products, and at the same time maintaining a surplus of these products for export.

A chart giving the numbers of beef and dairy cattle in the United States shows that beef cattle have undergone more fluctuation and that at present beef and dairy cattle are about equally numerous.

The livestock industry of any nation acts as a great storage reservoir for its surplus grains in years of plenty, and its grasses and forage crops that can not be eaten by man. It is a significant fact that no great meat-eating nation has ever suffered famine from crop failure.

AND AND CONTRACT OF THE CONTRA

#### "MARKET GRADES AND STANDARDS."

If trace is to be conducted in the most efficient manner those engaged in it must speak a common trade language. This means that the buyer and the seller must use the same trade terms and both must accept the same definitions of those terms. If the seller says he has a load of good steers for sale, the buyer should know what the other man calls a good steer; otherwise confusion is bound to result because good steers are worth a certain price; whereas steers that are either better or worse than good steers are selling at quite different prices.

Until recently, each livestock market has had its own system of grading meat animals, and even at a given market, men engaged in the trade have differed widely in their methods of appraisal. Furthermore, at the same market, standards frequently varied at different seasons of the year. In the fall when a large proportion of the animals coming to market were grass-fed, standards were unintentionally lowered, whereas in the spring, when most of the animals marketed showed firm fat and grain finish, it took a much better animal to be graded choice than was true in the fall, when such stock was comparatively scarce.

The situation was further complicated by the fact that although there was great variation in the standards of grading applied at different markets and even at the same market at different seasons of the year, and by individuals at the market, most of the agencies engaged in reporting market transactions to the outside world used a certain set of trade terms to describe trade and market conditions. Each reporter had his own set of definitions for these terms, but unfortunately these definitions varied widely among reporters, and the reader had no means of knowing just what definition the writer wished attached to the terms.

To eliminate the confusion arising from this condition, the United States Department of Agriculture has undertaken to work out a set of market classes and grades for cattle, hogs, and sheep and to define those classes and grades in a simple, understandable manner. These grades have been in use during the last four years in connection with the livestock and meat market news service which the Department maintains.

Colored photographs are shown, illustrating a particular class or grade of cattle, hogs, and sheep. Another panel aims to drive home in a graphic manner the necessity of having standards by which to judge the hundreds of thousands of meat animals bought and sold daily throughout the country, on the basis of which the relative value of these animals may be determined.

The Department hopes eventually to establish in the mind of every stock-man, commission man, packer, and even the meat consumer, a definite picture of the various classes and grades, to the end that if announcement is made that good beef steers are selling at \$10 per 100 pounds, any one, wherever located, will understand exactly what kind of animal is selling at that price.

.

and the first state of the first of the firs

en de la companya de la co

and the second of the second o

### "MARKET INFORMATION."

The purpose of this booth is to give the observer a graphic picture of the livestock and meat market news service of the United States Department of Agriculture. The outline map of the United States shows the 9 important livestock markets and 4 leading meat markets at which reporting offices are maintained. Each of these offices is manned by experienced reporters who spend most of their time during the trading day in the market. These men observe the supplies of the various commodities available, the number and attitude of buyers on the market, and learn the prices obtained and the tone prevailing in the trade.

Obviously, however, mere gathering of such information would be of small value were the work to end there. This information must be brought to the individuals and organizations engaged in these industries in the most complete form and in the shortest time possible.

To accomplish this the Department utilizes the most modern and expeditious means of communication available. One is a system of leased telegraph wires connecting 7 important livestock markets of the Middle West with 3 important meat-consuming centers along the Atlantic seaboard and all connected with headquarters in Washington. This wire is in operation from 6 a.m. to 6 p.m. during every market day of the year. At each of the markets indicated the reporters file messages at frequent intervals throughout the day. They are then put on the leased wire and immediately flashed to every other office on the circuit. Transactions at Chicago are frequently flashed to St. Paul on the north, Ft. Worth on the south, and Washington on the east within 5 minutes after the sale has been consummated. Such an arrangement renders these great trade centers open public markets in the strictest sense of the term.

Once the messages are distributed to the leased-wire circuit, each office takes up the market reports and gives them wide dissemination. Here the mails, the telegraph, the telephone, the radio-telegraph and radio-telephone are all utilized. Thousands of copies of reports are mimeographed daily and mailed to those making a request for them. Many farm bureaus, shipping associations, and other similar organizations receive the reports, and redistribute their contents to farmers and stockmen by telephone.

The telegraph operator seated in this booth with his instrument and typewriter is in immediate touch with every office on the whole circuit. The information written on the middle panel of the booth is a sample of the class of information constantly going over the wire. Estimated receipts of the various classes of livestock at each of 15 or 16 markets for the current day are shown on the left-hand side of the chart. The market comment, just to the right of these figures, shows the condition of the trade on cattle, hogs, and sheep on the Chicago market up to within a few minutes of the time it was placed there.

The U. S. Department of Agriculture has made every effort to get the most accurate market information at the earliest moment possible, and to make it available to the whole country in the shortest time possible. The Department has adopted the slogan - "TO-DAY'S MARKET TO-DAY."

and the second of the second o

The compared to the contract of the contract o

tion grows the first progress are some as with the first country to the content of the content for the content The content of United States Department of Agriculture

DEC! 1922

#### DESCRIPTION OF

# LIVESTOCK EXHIBIT

The exhibit which is very briefly described on the following pages deals with the essentials of animal production. Current livestock problems and conditions are also emphasized.

Much of the exhibit material is centered around areas where well-balanced systems of live-stock farming are practiced. The Gorn Belt and some adjacent areas have, therefore, been given special attention because of the excellent results obtained from the systems of livestock farming which are followed in those sections.

Representatives of the Department accompanying the exhibit are ready to explain to visitors various lines of the Department's work and to discuss livestock matters generally.



# "BEEF PRODUCTION."

The exhibit entitled "Beef Production" is based on an extensive survey being made by the Department of Agriculture and State agricultural colleges throughout steer-feeding sections in the States of Illinois, Indiana, Iowa, Missouri, and Nebraska. Several phases of beef production are being studied. The studies have involved approximately 20,000 steers each year for the last four years. One more year's work will complete the study.

Cattle feeders in the Corn Belt usually either buy their feeder cattle direct from the range or at the large livestock markets in the Middle West. Most of the feeders are finished on corn and legume hay, or corn and silage supplemented with a protein meal. The kind of hay grown in the locality usually determines the ration used. The survey has shown that about the same number of steers are fed throughout this region by each method. In those areas where clover and alfalfa hay are grown abundantly, the standard ration is corn and clover or alfalfa hay. The legume hay supplies the necessary amount of protein. In other areas where the bulk of the hay is mixed hay, silage is included in the ration to supply the roughage, and cottonseed or linseed meal is fed as a supplement to supply the protein.

The following table shows the length of feeding period and amounts of feed to make the same amount of total gain on a feeder steer, under each system of feeding, as determined from this survey. The figures apply to steers around 2 years of age, weighing 850 to 900 pounds at the time of going on feed.

	Corn and	Corn, silage &
	alfalfa hay	
Length of feeding period	. 146 days	185 days
Total gain	. 302 pounds	302 pounds
Daily gain	. 2.07 pounds	1.63 pounds

#### Feed consumed per steer:

Corn	pounds
Corn       30         Cottonseed meal       177         Mixed hay       690         Silage       5,583         Straw       612	pounds pounds pounds

Information on feeding problems and other phases of beef production can be secured by writing to the Department.

### "PORK PRODUCTION."

The booth entitled "Pork Production" gives the essential points for raising swine economically. The important factors under the control of the hog raiser are the type of animal grown and the feeding and management methods used.

When bred to big-type boars, big-type sows in proper physical condition at the time of mating, and well fed and managed during the gestation period will not only produce strong, vigorous pigs, but will have abundance of milk to neurish them properly.

Pasturage of good quality, shorts or wheat middlings and fish meal or tankage to furnish protein, with sufficient corn or barley to keep them in fair flesh, represent the feeds necessary for breeding hogs. Alfalfa, soy-bean or clover hay are valuable additions for winter feeding. It is important that breeding hogs be given daily exercise for the best results.

Any feeds supplied during the 24 hours before and after the act of farrowing are objectionable, and may be responsible for poor results with the newborn pigs. However, when feeds are again supplied in small amounts and gradually increased to full feed within about 10 days, the sows readily use them to advantage. It should be kept in mind that sows sparingly fed can not give milk enough to make pigs grow as they should.

Even before the pigs are weaned they should have access to corn in self-feeders as a supplement to the sow's milk. As soon as they are weaned the pigs should be kept on full feed, either by self-feeder or by hand. By this system pigs grow continuously from the moment of birth to maturity. Suitable feeds and exercise furnished to vigorous pigs of proper type result in the production of hogs of market weight at about eight months of age.

"The profitable pig is the one that never stops growing from farrowing to market," is a good slogan for every hog raiser.

.

# "HORSE PRODUCTION."

There is a need in the United States for production of horses and mules, especially those of better quality. Based upon 1920 census figures, about 200,000 fewer colts were produced in 1919 than were needed to supply replacements on facus alone. About 225,000 high-class animals are needed for annual replacements in cities, making a shortage in replacements of over 400,000 horses and mules in 1919 in the United States.

The surplus and shortage of horses and mules produced on farms is shown geographically on a map of the United States. In the area including the Middle West States of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Iowa, Missouri, Illinois, Indiana, and Ohio are produced most of the work horses and mules for the United States. Although most of our big draft animals needed in the cities and specialized farming areas come from this area, only a small surplus was produced above their own replacement needs in this region in 1919.

In the States of Kentucky and Tennessee where many good mules and light horses are produced, the production was about equal to replacement needs. In the 12 States west of and including Texas, where the horses produced are principally range stock, there was a very small surplus. Yet because most of the stock is undesirable, production may be said to be about equal to replacement needs. On the other hand, the production of horses and mules in the 24 Eastern and Southern States is only one-half that needed for replacements, and both farmers and city trade must look to other sections for replacements.

The Department calls attention to the fact that farmers might profitably produce replacements enough, in connection with general farming, to be able to sell off the older work animals each year. As local market values are determined by the city and eastern trade, it is important that the right kind be produced. The small undeveloped animal of poor quality is a drug on the market. The best brood mares should be bred to purebred sires of the right type, and feeding the youngster is of parallel importance to proper breeding. Pasture, which is a primary necessity, must be supplemented with grain and hay, and the colt kept growing at all times. Not only is the use of the non-salable roughages of economic importance, but the grain and hay produced in general farming may be profitably marketed through young stock.

As the market demands well-broken and trained horses that will last a long period of years, the colts should be broken at about 3 years of age and used on the farm for a few years. By this system these young horses together with the breeding stock will furnish the power for the average farm, and the young stock will be increasing in sale value. The maximum value of horses is at about 6 years of age and the surplus animals should be sold at this time. The well-bred horse or mule that has been properly fed and well broken is usually salable at a profitable figure, and should increase the income of the general farmer.

#### "WOOL AND WARMTH."

The exhibit "Wool and Warmth" furnishes information of interest to growers, manufacturers, and the public. Wool varies a great deal in fineness, length, strength, and manufacturing value. The selection and breeding of sheep govern in large measure the fineness and to quite an extent the length and spinning quality, while the feeding, care, and health of the sheep are of vital importance in the production of heavy, strong, lofty fleeces useful in the manufacture of warm, durable, and attractive garments, robes, and blankets.

When shearing sheep their fleeces should be dry and the work done on a clean, well-swept floor free from straw, chaff or litter of any kind. The fleece ought to be clipped close to the skin and the shearer should avoid second cuttings of the same wool as fibers of good length are desirable. The next step is to roll and tie the fleece, wrapping the string around the fleece once in each of two directions at right angles to each other.

The fabrics shown on the center panel illustrate the suitings made from wool of half-blood fineness and overcoating made from wool of coarse grades. It will be noted that half-blood wool of good length is called "combing" wool. This is a trade term which indicates that the wool is of sufficient length to be combed in the manufacturing process. Wool of such length can be made into durable worsted as shown. The short wool from which the woolen suiting is made has the grade term "half-blood clothing." "Half-blood" indicates that the fineness is the same as that of the wool from which the worsted was made, while the word "clothing" indicates that the wool is too short to be combed. Such wool is generally made into woolen or flannel goods, therefore, worsted is more durable and usually more popular than the woolen or flannel goods when the worsted and woolen are of equal weight and the wools from which they are made are of equal fineness, strength, and spinning quality.

On the basis of fineness, prices of wool are quoted by the following grades, which are named in the order of fineness: Fine, half-blood, three-eighths-blood, quarter-blood, low quarter-blood, common, and braid. The word "blood" in connection with wool grade terms has no reference to the breeding of sheep but is used in connection with fractions to designate fineness. Fine and half-blood wool are produced by purebred and high-grade Merinos and Rambouillets; three-eighths-blood and quarter-blood by medium-wool sheep, such as Shropshires, Hampshires and Oxfords; low quarter-blood by the coarsest of medium-wool sheep and grade coarse-wool sheep, and braid by high-grade, or purebred, coarse-wool sheep, such as Cotswold, Lincolns, and Leicesters.

The grade "fine" is the finest and "half-blood" the coarsest of what is commonly called fine wool, that is, half-blood wool is coarser than the finest of Merino or Rambouillet wool, but finer than what we usually call medium wool; "three-eighths-blood" is the finest of medium wool, and "quarter-blood" the coarsest of medium wool; "low quarter-blood" is coarser than half-blood, but the finest of coarse wool, while "braid" is very coarse and "common" is intermediate in fineness between low quarter-blood and braid.

### "MEAT PRODUCTION."

The average person seldom stops to consider the important part played by livestock in converting many farm crops and by-products, feeds not suitable for food for man, into edible, concentrated food. The utilization of such feeds as forage crops and by-products of the factory by livestock, to be converted by them into human food, is not only one of the fundamentals of economical meat production, but is the basis of any permanent system of agriculture. In addition to such feeds there is always a large crop of the various grains which can not be consumed by man, and these are most advantageously utilized when converted into meat.

The 1922 corn crop exceeds two and three-quarter billions of bushels, or about 26 bushels for every man, woman and child. No one can eat 26 bushels of corn, but when it has been converted into meat any one can eat the meat that it produces. This is shown pictorially in the exhibit in the center panel.

The panel entitled "Pasture Helps Fill the Meat Platter" shows cattle, hogs, and sheep on pasture, busy converting grass into meat to add to the Nation's food supply. In the panel entitled "Utilize By-Products Through Feedlot Methods" these three classes of livestock are shown in the feedlot where they may be fed many by-products that would otherwise go to waste.

Meat contains a large amount of proteins, which are body-building substances, in a form easily digested and readily assimilated by the body. It also contains vitamins which are necessary for the normal growth and vitality of the body. Furthermore, meat supplies these food substances in an appetizing and concentrated form. A liberal proportion of meat in the diet tends to make a physically and mentally well-balanced race as well as a well-balanced agriculture.

the second of th

n ( 5 m.

### "MEAT AND ITS USES."

An education in the selection and preparation of meats can be secured by a careful study of the pictures and text in the exhibit entitled "Meat and Its Uses." The housewife who buys the meat often has no definite idea of the relative value of the different cuts of meat, and in most cases she can not tell a choice piece of meat from an inferior one until she has it on the stove cooking, or until it has been served on the table.

The cheaper cuts from a choice carcass are always superior to higher-priced ones from a common carcass. Therefore if the person who buys the meat for the family can recognize meat from a choice carcass at a glance, the problem of economical meat for the family will be greatly simplified. Illustrations are shown of cuts of beef and a magnified section of beef both from choice and inferior or common carcasses. Meat from a choice carcass is well marbled (desirable balancing of fat and lean), the fat is firm and white, and the lean is bright red in color; while meat from a common carcass shows little or no marbling, the fat is yellowish, and the lean is a purplish red color.

Many people hesitate to purchase meat cut from the fore quarters of a steer, but these cuts are tender and palatable when taken from choice steers that have been properly grown and fattened for market. The greater purchasing power of a dollar is shown to be in the fore-quarter cuts of beef by a series of pictures of cuts of meat. The figures from which this comparison was compiled were reported by the U. S. Department of Labor, and based on average retail prices in 1921 in 51 cities of the United States. According to these figures, one dollar will buy slightly over two pounds of porterhouse steak, more than 2-1/2 pounds of sirloin steak, nearly three pounds of round steak, 3-1/2 pounds of rib roast, nearly 5 pounds of chuck roast, and nearly 7 pounds of plate beef.

The center panel of this exhibit illustrates methods of preparing meats. A pot roast is shown with potatoes and vegetables, making a well-balanced meal, the meat being prepared in such a way as to preserve all flavors and nutrients. This method of preparing a meal saves both time and fuel. An illustration shows the use of left-over meats and vegetables in making meat salads; and another the making of sandwiches from cold meats which are as nutritious as hot meats.

Bulletins containing useful recipes for the proper preparation of meats may be obtained from the Department.

#### "EFFICIENCY OF PUREBREDS."

Figures of the Department of Agriculture, based on actual results with 55,000 head of breeding stock on farms throughout the United States, show that the average superior earning power of purebred over common livestock is 40.4 per cent. This greater earning power is the result of many different factors. The purebred animal is able to make better use of a given amount of feed. The meat of a well-bred steer or hog is of better quality and brings a higher price than that of an ordinary carcass.

The dressing percentage of well-bred livestock is found to be greater than that of the average animal. Fewer animals required to make the same amount of marketable product enable the livestock man to save time, labor, and housing space. The offspring of purebreds have greater market value than the young of common animals. All these factors are reasons for the greater efficiency of purebreds, and good reasons why farmers everywhere should begin at once getting acquainted, first hand, with their advantages.

The superiority of purebreds is illustrated in the exhibit by a balance having at one end a pen of purebred stock, and on the other a pen of common stock. The purebred stock overbalance the common stock by 40 points as measured on the "Superiority" side of the scale.

Another panel shows a purebred boar which was slaughtered at the age of 3 years, 10 months, long before his value as a sire had passed. His carcass, which is shown dressed, weighed 1,005 pounds. This boar was too valuable to have been slaughtered in his prime. Farmers often fail to study the production records as well as the breeding records of their purebred males, not realizing that an older animal which has proved himself in his get may be much more valuable than a younger animal with a more promising pedigree.

Another panel shows a purebred calf which weighed 1,200 pounds at just a year old, illustrating the ability of well-bred stock to make rapid gains and mature quickly. A study made by the Department including large numbers of livestock owners in a wide range of States, showed that users of purebred sires are 95 per cent satisfied with them as individuals, and 99 per cent satisfied with their offspring. This is an excellent recommendation for those farmers who have not become acquainted with purebreds.

Department Circular 235 gives full information on the subject of the efficiency of purebreds.

the second secon

### "BETTER FEEDING."

This booth urges a study of modern feeding methods to get the best results with livestock. It points out particularly the great advantage to be obtained by the livestock man if he will study in advance his feeding problems and use the right feed at the right time. Such a system saves feed bills and grows better stock.

Not only must the right kind of feeds be fed, but they must be supplied in the correct proportions. The balanced ration is the most economical one. Corn should always be supplemented with protein feeds, even when there is a large corn crop and corn is cheap. Statistics show that cheap-corn years are usually followed by heavy losses of pigs, because insufficient protein feeds have been used by a great many farmers. In hog feeding, the self-feeder and the hay rack are the most economical means of providing sows and growing pigs with sufficient body-building proteins. Plenty of fresh water and lots for the brood sows that provide exercise are as important as proper feed.

Throughout all feeding work, it should be remembered that as young stock makes the most economical use of feed, an effort should be made to get the animal ready for market as quickly as possible.

The best feeding practices can not achieve the best success unless the animals to be grown and fattened are of good quality. When selecting feeders it should be remembered that good quality indicates good feeding ability. Good breeding practice and good feeding practice go together.

An excellent example of the benefits to be derived by the judicious use of the proper feed at the right time is given by the results of investigations by the Department with flushing of ewes to increase the lamb crop. The results of six years' experimental work show that 100 flushed ewes produced 148 lambs, while 100 unflushed ewes produced only 128. The flushing should begin at least two weeks before breeding and continue until conception. Ewes should gain at least seven pounds during the flushing period. Fresh grass pastures, soy beans and cowpeas are excellent flushing feeds. Mixed grain or oats should be used when pastures are dry and fresh foliage is not available.

It is possible to give but a few points on better feeding practices in an exhibit of this nature. Persons desiring assistance with their feeding problems are invited to write to the Department for more detailed information.

E 12 O TE E PL PLE

...

•

#### UNITED STATES DEPARTMENT OF AGRICULTURE

#### Livestock Exhibit

#### "ANIMAL HEALTH SAFEGUARDS"

A colored map showing by counties the extent of bovine tuberculosis in the United States is one of the features of this portion of the exhibit. Tuberculosis infection is shown to be relatively slight in extensive areas. Only 0.6 per cent of the cattle are tuberculous in an area containing 46.4 per cent of the total area of the United States, and containing 41.2 per cent of the total cattle in the country. Less than 1.5 per cent of the area of the country has an infection of more than 15 per cent of the cattle. However, 4.3 per cent of the cattle, or 2,960,954 head are to be found in this area. Nearly five times as many tuberculous cattle are contained within an area of about 50,000 square miles as in another area containing more than 1,500,000 square miles.

A study of this map enables livestock owners to learn the sources of greatest danger, and they can use special precautions when buying their breeding stock. A study of the distribution of this disease among the cattle of the country also shows the nature of the task that confronts the nation in its campaign to eradicate this disease.

Tuberculous cattle spread the disease to swine. Hogs are infected by following diseased cattle, and by drinking milk from tuberculous cattle. Milk for hogs should be boiled if it is not from tuberculosis-free herds. The following figures show the losses due to tuberculosis, during the fiscal year 1922. These figures are based on Federal Meat-Inspection records:

Cattle	Slaughtered 7,871,457 39,416,439	Carcasses condemned 39,434 70,304	Parts condemned 60,441 666,787
Pounds beef lost (estim Pounds pork lost ( "	ated)		

These figures can give but an idea of the total loss the nation sustains annually because of bovine tuberculosis. Animals affected with the disease can not make the best gains. The danger to human health is a further reason why tuberculosis of livestock should be suppressed.

The vigorous campaign being conducted by the Federal government and the various States for the eradication of this dread disease has resulted up to November 1, 1922, in 20,041 accredited herds in the United States, in which 435,941 cattle have been pronounced free from tuberculosis. This work is making satisfactory progress and it is believed to be possible, eventually to free the country of bovine tuberculosis.

. . .

the state of the s

In a protection of the contraction of the contraction of the contraction of the contraction of the first of the contraction of

and the contract of the second of the second

BARBERAL BARBON AND ARRA BARBON AND BARBON BARBON BARBON BARBON AND ARRANGED AND ARRANGED AND ARRANGED AND ARRANGED AND ARRANGED ARRANGED AND ARRANGED ARRANGED AND ARRANGED A

មានប្រជាពលរបស់ស្រាស់ ស្រែក្រុម ស្រាជិក្សាស្រាស់ ស្រែក្រុម ស្រែក្រុម ស្រែក្រុម ស្រែក្រុម ស្រែក្រុម ស្រែក្រុម ស្រែក្រុម ស្រែក្រុម ស្រ ស្រែក្រុម ស្រែក្រុម

### "LIVESTOCK WELFARE."

The livestock-welfare work of the United States Department of Agriculture consists of experiments in the feeding and breeding of livestock, experiments in the prevention and control of insects, parasites and predatory animals harmful to livestock, and reporting information obtained in these experiments.

So far as possible these experiments are conducted at places in the United States where the conditions approach those actually confronting livestock farmers. This system of experimentation makes the results of greatest value to the livestock man. A large map of the United States is shown in the exhibit, and on it are indicated the points at which experiments are conducted, with a brief statement of the work at each point. Visitors are welcome at the various experiment stations and farms.

Proper sanitation on livestock farms is vitally necessary for the welfare of America's livestock. Careful breeding and careful feeding can not assure success unless the animals have clean, dry pens and houses in which to live. Another phase of this question is the danger to the health of the farm family. Some diseases of livestock are communicable to man. Pictures of clean and unclean quarters for hogs are shown.

The part of this exhibit dealing with the use of cull potatoes for livestock feed is an example of the Department's welfare work in meeting a specific, current problem. The 1922 potato crop promises to be one of the largest ever grown in America. The Department of Agriculture emphasizes, for the benefit of the farmer who is confronted with the problem of marketing these potatoes, that none of this year's large crop of potatoes need go to waste if they are carefully graded before being marketed, and the culls used as livestock feed. Potatoes may be fed with good results to all classes of livestock when properly prepared and fed in the right amounts. The exhibit gives the Department's recommendations for handling the potato situation.

The state of the second st

1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年,1997年 

### "STOCK-POISONING PLANTS."

Plants which are injurious to domestic animals are found in all parts of the United States. The heaviest losses by poisoning, however, have occurred in the West, partly because of the methods used in handling animals on the range, and partly because those plants sometimes grow in that part of the country in large masses. Three groups of plants which are especially destructive in the range country have been chosen to illustrate the exhibit.

Barkspurs grow in the eastern United States and cause some losses, but they are found in especial abundance in the mountain regions of the West. They are poisonous to horses, but all the losses under range conditions are of cattle. Sheep can graze on larkspur without harmful effect, but heavy losses are caused in cattle. The exhibit shows pictures of cattle showing the characteristic symptoms of larkspur poisoning at various stages of the attack. A method of treating cattle poisoned by larkspur has been found which will prevent a large part of the losses. It is also possible in restricted areas to grub out enough of the plants to prevent serious loss. For further information Department Bulletin 365 or Farmers' Bulletin 988 may be consulted.

The whorled milkweeds are not so widely distributed as some other plants but they are especially injurious because of their intensely poisonous character. They affect cattle, horses, and sheep, but most of the losses have been of sheep. Two or three ounces of the plant may kill a sheep. These plants are never eaten by animals by choice, but only when they are deprived of other suitable forage. Details in regard to them may be found in Department Bulletins 800 and 969.

The loco weeds are probably the most destructive of all the poisonous plants of the West. They affect cattle, horses, and sheep, and have caused enormous losses. The symptons come on only after somewhat prolonged feeding, and recovery, if it occurs, is a long process. There are a number of loco weeds, and three of the most important are illustrated in the panel. Various closely related plants of the pea family are popularly called locoes but are not poisonous. Loco plants are widely distributed, covering a large portion of the plains areas of the West. Methods of treatment have been devised by which recovery can be practically assured in regard to cattle, and horses may recover to such an extent as to be useful, although they are never so good as before suffering from the disease. Further information in regard to loco poisoning may be obtained from Farmers' Bulletin 1054.

### "FOREST-RANGE MANAGEMENT."

Although the resources of our national forest ranges for feeding livestock are of vast extent, it is important that those ranges be managed wisely in order to preserve them for future generations. This booth familiarizes the visiting public with the best methods of handling livestock on forest ranges in order to prevent waste and destruction.

The old way of herding range sheep in large masses resulted in damage to the range, the forage plants being trampled out and the surface of the soil cut up by trails. This reduced the carrying capacity of the range. The Department recommends that sheep be handled by the open or "burro" method, which means that the animals are allowed to scatter out over the range, bedding down at night quietly but not in large bodies or in one single place. Such herding methods increase the carrying capacity of the range and produce fatter sheep and lambs.

A colored diagram shows the result of former methods when sheep were driven back to the same bed ground for many nights. First, the bed ground itself was utterly denuded of all forage plants; then, the adjoining range began to deteriorate, the areas closer to the bed grounds suffering most. With the open method no bed ground is used more than one night at a time. Under the former system of range management the annual loss in grazing capacity per square mile was approximately 300 sheep, and much of this grazing land was permanently ruined for grazing purposes.

For many years western stockmen believed that cattle and sheep could not graze upon the same range. This has proved to be a myth. It is entirely a question of management. Broadly speaking, cattle prefer grasses, while sheep are fond of weeds. Horses can feed on range unsuited to sheep and too far from water for cattle.

One of the first indications of overgrazing and injury to the range is the disappearance of the best grasses and weeds and the coming in of nonpalatable plants. This deterioration follows in almost regular succession, each period showing the loss of the palatable plants and an increase in the number of nonpalatable ones. Stockmen should study the plant life on their ranges so they can detect these changes in the range cover in sufficient time to take the steps necessary to prevent further deterioration.

Further information on the subject of forest-range management is available from the Department.

The state of the s

### "MAKE YOUR POULTRY PAY"

In this exhibit the Department calls attention to culling as a means of increasing egg production. One lot of 12 hens is shown, which was not culled, and which in one year ate 900 pounds of feed costing \$20.70; the 12 hens laid 100 dozen eggs. Contrasted with this lot is one of 8 hens which were culled, and which laid the same number of eggs, but ate only 600 pounds of feed at a cost of \$13.50. The lot of 12 hens that was not culled ate 50 per cent more feed than the lot that was culled and produced no more eggs. The extra cost of feed, however, is but one of the larger costs. Others are the extra labor, extra housing room, and extra capital invested.

To enable the poultryman to cull his hens properly, the exhibit gives the points to be looked for when determining a poor layer, or a good layer. These outlines are as follows:

### How to determine a poor layer:

Comb--Shrunken, dull and whitish scales.

Eye--Sunken, dull and listless.

Beak--Deep yellow (on yellow-shanked breeds).

Shank--Deep yellow (on yellow-shanked breeds).

Pelvic bones--Thick, rigid, close together.

Abdomen--Rather hard and shallow from pelvic bones to end of keel.

Vent--Small, puckered, dry.

A poor producer molts early, in July and August.

# How to determine a good layer:

Comb--Full, bright, red, waxy.

Eye--Bright, prominent, alert.

Beak--Pale or white (on yellow-shanked breeds).

Shank--Pale or white (on yellow-shanked breeds).

Pelvic bones--Thin, flexible, wide apart.

Abdomen--Flexible and deep, as measured from end

of keel to pelvic bones.

Vent--Large, expanded, moist.

A good producer molts late, in September and October.

Bulletins giving further information on the subject of selecting good layers, and on other subjects relating to poultry management may be secured by writing to the Department of Agriculture.

### " EQUIPPING A LIVESTOCK FARM."

Good buildings and equipment save feed and labor. This feature in livestock farming, so often overlooked, is emphasized by pictures and brief comments. Drawings and blueprints of farm homes, cattle barns, horse barns, sheep barns, hog houses, and poultry houses, are shown. Duplicates of these and others of different design may be obtained from the Department of Agriculture.

The panel entitles "Clean pens.-Greater gains" pictures a make-shift hogpen which has been thrown together by placing some old fodder and straw on a frame built of fence rails. The type of hog is shown that is usually found living in such quarters. Even well-bred hogs of good quality can not be expected to make the best gains in flark, damp, insanitary houses. Contrasted with this is an illustration of clean and comfortable hogpens provided with dry, clean houses, self-feeders, automatic fountains, shades and wallows. The type of hog that belongs with such equipment is pictured in contrast to the one which shows lack of proper care.

A group of inferior farm buildings with rubbish scattered about the yards, is contrasted with up-to-date buildings. Inferior buildings are wasteful of feed and labor, unsightly, and insanitary, and harbor disease. Careful choice of building sites and good substantial buildings save time, labor and feed, protect the health of livestock and make farm life more attractive.

Consult the Department of Agriculture for plans of buildings that are convenient, durable, economical, and attractive.

# The same of the same of the same of the

net in the second of the secon			l :	
the second of the second	and the second s		•	
est de la companya de				

. . . .

### "LIVESTOCK STATISTICS."

Figures show that the United States has but one-sixteenth of the world's population, but it has one-sixth of the world's livestock, approximately as follows:

One-half of the world's 9,000,000 mules One-third of the world's 169,000,000 swine One-fifth of the world's 100,000,000 horses One-seventh of the world's 492,000,000 cattle One-ninth of the world's 465,000,000 sheep

Statistics show that the United States ranks fourth in the per capita consumption of meat. The following table shows the figures for the principal meat-eating nations of the world. (U.S. figure is a loyear average from 1912 to 1921; other figures are prewar.)

Country Lbs. meat	Country Lbs. meat	Country Lbs. meat.
Argentina 281	France 80	Norway
Australia 263	Denmark	Sweden
New Zealand 213	Switzerland 75	Poland 62
UNITED STATES 142	Belgium70	Russia 50
Canada 137	Netherlands 70	Spain
United Kingdom 120	Greece68	Italy 47
Germany 115	Austria-Hungary 64	

A chart showing the trend of human and livestock population from 1850 to 1922 shows that human population has had the greatest increase, that the number of swine is the most variable, and that sheep show the greatest general decline. The relative positions of the curves in 1922 indicate more and more difficulty in supplying our ever-increasing population with sufficient meat products, and at the same time maintaining a surplus of these products for export.

A chart of per capita meat consumption in the United States from 1907 to 1922 shows a considerable decline. The consumption of veal is about equal to that of mutton and lamb, and as a rule slightly more pork is consumed than beef.

Another chart giving the numbers of beef and dairy cattle in the United States shows that beef cattle have undergone more fluctuation and that at present beef and dairy cattle are about equally numerous.

The livestock industry of any nation acts as a great storage reservoir for its surplus grains in years of plenty, and its grasses and forage crops that can not be eaten by man. It is a significant fact that no great meat-eating nation has ever suffered famine from crop failure.

may be a server of the second 

# "HIDES AND LEATHER."

The attention of stockmen is directed especially to the "Hides and Leather" exhibit containing samples of actual leather. Fifty per cent of the hides and skins used in the United States are imported. Our domestic supply, which comes either directly or indirectly from stockmen, from the farms and ranges, is totally inadequate. It therefore is well for us to develop our supply to the ntmost and to eliminate waste that we may lessen our dependence on foreign sources.

Good hides and skins mean good leather. Good leather means greater serviceability and eventually less costly leather. The quality of the hide goes back to the life of the animal. Protection of the hide from the ravages of pests and from mistreatment by man is as necessary as is good stock. A hide riddled with grub holes, or poxed with tick bites, or seared with brands, or damaged from horn marks and wire cuts represents a loss in value and in leather.

Proper skinning and curing are particularly important. Much of the value of a hide or skin depends upon the "take-off." In the beef packing business roughly 10 per cent of the total returns is obtained from the hide. A hide of first quality must be free from cuts and scores and must be clean and of correct pattern. It must be free from meat and flesh. A fresh hide is like so much fresh meat; it must be promptly cured or it will spoil. A properly cured hide makes good leather; a rotten hide is a complete loss.

The results of failure properly to care for hides and skins is strikingly shown by these exhibits. Failure is avoidable to a large extent, if not entirely. The farmer, as a class, is the largest user of leather. He consequently is vitally concerned in its serviceability. As a rule a farmer uses his harness for less than 10 years; if proper attention is given to its manufacture, selection, and use, it should last 20 years longer. Belts for machinery often become impaired, if not useless, within a few years. A good leather belt, suited to the work, properly installed and cared for, will run for from 10 to 30 years. Every pair of shoes, every machine belt, and every piece of harness that is allowed to go to waste or that is not made to yield full service must be replaced.

Select leather articles suitable for the work at hand. Care for them by regular and frequent cleaning, oiling and dressing. Make all repairs promptly and properly. Help conserve our leather supply!

For detailed information on hides, skins, and leather ask for Farmers' Bulletins 1055 and 1183, which will be send free of charge.

### "CROPS FOR LIVESTOCK."

Corn, clover, oats and soy beans are the crops selected to illustrate the exhibit "Crops for Livestock." They are all successfully grown in the Corn Belt where a large percentage of our livestock is produced.

Corn is the most important crop in the United States, both in acreage and in value. The amount of yield is greatly influenced by the quality of seed that is planted. This is illustrated in the exhibit by pictures of two baskets of corn grown on equal areas. The basket from the area planted with good seed contains more corn and larger, better-shaped ears than the basket containing the corn grown from the poor seed. If the corn is to be fed to hogs, one of the cheapest methods of harvesting it is to turn hogs in the field and let them eat the corn from the stalks -- commonly called "hogging down."

Clovers make excellent feed whether used as pasture, as hay, or as soiling crops. Their high protein content make them valuable feed for growing animals, and a good supplement with corn. One ton of clover hay has a feeding value equal to 1-1/2 tons of timothy hay, 3/4 ton of shelled corn or 2/3 ton of wheat bran for fattening animals.

Oats is the standard grain feed for horses in most sections of the country, and is recognized everywhere as a good growing feed for all young stock. Oats is an easily digested feed and has a high protein content.

Soy beans is another crop that makes good hay and is becoming popular in the Corn Belt as a pasture crop. It can be grown on a wide range of soils, but inoculation is necessary when it is grown for the first time. Soy-bean hay contains a high percentage of protein and is highly palatable. Soy beans are usually grown with corn, when used for silage. Bulletins describing proper methods of handling the above-named crops and their use as feed for livestock, can be secured from the Department.

### "UTILIZATION OF FEEDS."

In planning feeding operations the livestock feeder often wishes to know how much feed of different kinds is required to fatten a steer or a hog or a sheep, or a carload of either. The booth shows pictorially and graphically the approximate amounts of feed, and successful combinations of feed, that will fatten a carload each of sheep, hogs, and steers. They are as follows:

600 bushels of corn and 17 tons of hay will fatten 250 lambs weighing 55 pounds each, and make them weigh 80 pounds, or one double-deck carload.

450 bushels of corn and 2,750 pounds of tankage or fish meal will fatten 70 hogs averaging 100 pounds, to 200 pounds each, making one carload.

1,100 bushels of corn, 10 tons of alfalfa hay and 5 tons of straw will fatten 20 steers averaging 850 pounds, causing them to gain 325 pounds each in 180 days, making one carload.

The exhibit shows strikingly how livestock concentrate the bulk of farm products and thus greatly reduce the cost of transportation to market.

"Livestock Need Crops--Crops Need Livestock" is the title of a panel on which are set forth some of the benefits of well-balanced farming which involves maximum crop production and the use of crops on the farm by livestock. Such a combination produces an even distribution of labor throughout the year, permits the use of rough lands, saves surplus feeds and feeds that would otherwise go to waste, conserves the fertility of the soil, and reduces the cost of shipping the production of the farm to market, as noted above.

No matter how well-balanced the system of farming may be, however, it can not be successful without good crop yields. Proper crop rotation is necessary to obtain good crop yields. Two good Corn Belt rotations are shown by pictorial diagrams. For regions where winter wheat is grown a good rotation is: Corn; corn and soy beans; oats or soy beans; wheat; clover or sweet clover. For regions where winter wheat is not grown a good rotation is: Corn; corn and soy beans; oats; clover or sweet clover.

All recommendations for feeding and farm management practices must be of a general nature. Each farm presents an individual problem that must be analyzed and solved to fit its special conditions. The Department is always glad to answer questions that will enable the farmer to solve such problems.

### "REDUCE PRODUCTION COSTS."

Cost of production of livestock is influenced by many different factors. High production costs may be due to inferior quality of animals, faulty breeding methods, poor feeding practices, improper housing, unbalanced farm system, or insufficient size of business. The lowering of these costs is largely a question of management and in many instances more practical and less expensive methods of production can be used.

The exhibit illustrates desirable methods of handling livestock, and outlines good practices in the breeding and feeding of cattle, hogs, and sheep.

cheap land, and fattened in regions where corn is plentiful. On the range native grasses should be given opportunity to reseed themselves by proper grazing practices. An extra feed supply should be kept on hand for times of pasture shortage and for long winters. In the feed lot the equipment (and this applies with equal importance to all livestock management) should be practical and labor-saving, but not elaborate and expensive. For growing animals a liberal amount of protein should be provided in the ration. This can usually be supplied at the least cost in the form of legumes. The calf crop can be increased by eliminating from the herd all shy breeders, non-breeders and old cows, by having bulls in vigorous breeding condition, and by keeping the animals healthy.

In hog management, more attention is often paid to the feeding of fattening hogs, than to breeding sows. Inattention and carelessness during gestation and at farrowing often causes great losses. One of the most practical means of reducing swine production costs is to increase the number of pigs raised per sow. Sows of the brood-sow type should be selected for breeding. Where possible they should themselves be chosen from large litters. When the sow has farrowed, every effort should be made to save the young suckling pigs. Sows and pigs may be turned on pasture early, and the young pigs should be allowed access to a self-feeder where corn can be supplied as a supplement to the sow's milk.

Correct sheep management differs from the management of cattle and hogs only in the details. The net profits should be made as large as possible by keeping the ewes healthy the year around and in a gaining condition at breeding time, by discarding barren ewes and old ewes with broken mouths, by selecting vigorous rams of fixed type showing masculinity, and by careful attention during lambing. On the range care should be used in grazing in order to protect the grazing lands, and legume hays should be fed with cheap roughages where grazing is not available. Stomach worms increase production costs, especially on farms, and these should be prevented by pasture rotation and bluestone treatment.

Bulletins on the proper management of all classes of livestock may be obtained by writing to the Department.

and the second of the second of the second of the second of

### "MARKET INFORMATION."

The purpose of this booth is to give the observer a graphic picture of the livestock and meat market news service of the United States Department of Agriculture. The outline map of the United States shows the 9 important livestock markets and 4 leading meat markets at which reporting offices are maintained. Each of these offices is manned by experienced reporters who spend most of their time during the trading day in the market. These men observe the supplies of the various commodities available, the number and attitude of buyers on the market, and learn the prices obtained and the tone prevailing in the trade.

Obviously, however, mere gathering of such information would be of small value were the work to end there. This information must be brought to the individuals and organizations engaged in these industries in the most complete form and in the shortest time possible.

To accomplish this the Department utilizes the most modern and expediticus means of communication available. One is a system of leased telegraph wires connecting 7 important livestock markets of the Middle West with 3 important meat-consuming centers along the Atlantic seaboard and all connected with headquarters in Washington. This wire is in operation from 6 a.m. to 6 p.m. during every market day of the year. At each of the markets indicated the reporters file messages at frequent intervals throughout the day. They are then put on the leased wire and immediately flashed to every other office on the circuit. Transactions at Chicago are frequently flashed to St. Paul on the north, Ft. Worth on the south, and Washington on the east within 5 minutes after the sale has been consummated. Such an arrangement renders these great trade centers open public markets in the strictest sense of the term.

Once the messages are distributed to the leased-wire circuit, each office takes up the market reports and gives them wide dissemination. Here the mails, the telegraph, the telephone, the radio-telegraph and radio-telephone are all utilized. Thousands of copies of reports are mimeographed daily and mailed to those making a request for them. Many farm bureaus, shipping associations, and other similar organizations receive the reports, and redistribute their contents to farmers and stockmen by telephone.

The telegraph operator seated in this booth with his instrument and typewriter is in immediate touch with every office on the whole circuit. The information written on the middle panel of the booth is a sample of the class of information constantly going over the wire. Estimated receipts of the various classes of livestock at each of 15 or 16 markets for the current day are shown on the left hand side of the chart. The market comment, just to the right of these figures, shows the condition of the trade on cattle, hogs, and sheep on the Chicago market up to within a few minutes of the time it was placed there.

The U. S. Department of Agriculture has made every effort to get the most accurate market information at the earliest moment possible, and to make it available to the whole country in the shortest time possible. The Department has adopted the slogan - "TO-DAY'S MARKET TO-DAY."

#### "MARKET GRADES AND STANDARDS."

If trade is to be conducted in the most efficient manner those engaged in it must speak a common trade language. This means that the buyer and the seller must use the same trade terms and both must accept the same definitions of those terms. If the seller says he has a load of good steers for sale, the buyer should know what the other man calls a good steer; otherwise confusion is bound to result because good steers are worth a certain price; whereas steers that are either better or worse than good steers are selling at quite different prices.

Until recently, each livestock market has had its own system of grading meat animals, and even at a given market, men engaged in the trade have differed widely in their methods of appraisal. Furthermore, at the same market, standards frequently varied at different seasons of the year. In the fall when a large proportion of the animals coming to market were grass-fed, standards were unintentionally lowered, whereas in the spring, when most of the animals marketed showed firm fat and grain finish, it took a much better animal to be graded choice than was true in the fall, when such stock was comparatively scarce.

The situation was further complicated by the fact that although there was great variation in the standards of grading applied at different markets and even at the same market at different seasons of the year, and by individuals at the market, most of the agencies engaged in reporting market transactions to the outside world used a certain set of trade terms to describe trade and market conditions. Each reporter had his own set of definitions for these terms, but unfortunately these definitions varied widely among reporters, and the reader had no means of knowing just what definition the writer wished attached to the terms.

To eliminate the confusion arising from this condition, the United States Department of Agriculture has undertaken to work out a set of market classes and grades for cattle, hogs, and sheep and to define those classes and grades in a simple, understandable manner. These grades have been in use during the last four years in connection with the livestock and meat market news service which the Department maintains.

Colored photographs are shown, illustrating a particular class or grade of cattle, hogs, and sheep. Another panel aims to drive home in a graphic manner the necessity of having standards by which to judge the hundreds of thousands of meat animals bought and sold daily throughout the country, on the basis of which the relative value of these animals may be determined.

The Department hopes eventually to establish in the mind of every stockman, commission man, packer, and even the meat consumer, a definite picture of the various classes and grades, to the end that if announcement is made that good beef steers are selling at \$10 per 100 pounds, any one, wherever located, will understand exactly what kind of animal is selling at that price.

## "FARM FLOCK IMPROVEMENT BY THE USE OF PUREBRED RAMS."

In an exhibit consisting of several pens of live sheep at the International Livestock Exposition, the U.S. Department of Agriculture illustrates the possibilities in the improvement of farm flocks by the use of purebred rams of good quality, yet of moderate price. These sheep and others are being used in an investigation of this problem at the U.S. Morgan Horse Farm, Middlebury, Vt.

The foundation of this line of breeding is the mating of western ewes and purebred Southdown and Shropshire rams. In the production of these first and second crosses, rams of good quality were used, but they were similar to rams that may be purchased at reasonable prices. The two rams exhibited are now used in this experiment and are typical of other rams that have been used.

One pen contains 12 western ewes which were selected from a carload of 120 ewes purchased by the Bureau of Animal Industry in the summer of 1918. They are not the best, but are representative of what farmers should be able, ordinarily, to obtain at any of the principal livestock markets.

The 6 first-cross Southdown ewes in another pen were selected as the average in quality of the 20 three-year-old, first-cross Southdown ewes at the farm; while the 6 two-year-old, first-cross Shropshire ewes in a third pen were selected as representative of the 20 first-cross Shropshire ewes still in the flock. These ewes are offspring of pure-bred rams and western ewes, similar to those in this exhibit. The 12 second-cross ewe lambs are true to the type of the offspring produced by mating purebred rams and first-cross ewes.

Only an intermediate stage in the progress of this breeding experiment is illustrated by the sheep in these pens. Further top crosses are being produced and complete records of the results are kept which will be useful to sheep raisers of farming sections throughout the United States.

## "THE STORY OF THE STOMACH WORM."

The prevention of injury and loss by stomach worms is one of the most serious problems confronting owners of farm sheep. Either lambs or sheep may be affected by the worms at any season of the year. They prevent proper growth and development, and are therefore particularly destructive to lambs. The injury and losses caused by stomach worms are often so great as to wipe out entirely the profits of sheep raising.

The Department of Agriculture has made a study of the life history of this parasite and found a practical and inexpensive treatment that will prevent stomach-worm injury. This treatment is known as the blue-stone (copper sulphate) treatment. The exhibit on this subject consists of a pen of sheep which are used to demonstrate the treatment, and a large sign above the pen which gives in brief form the principal events in the life history of the stomach worm, and a statement of the benefits to be derived by ridding sheep of the parasite.

The life history of the stomach worm is briefly as follows:

- 1. Wormy sheep scatter worm eggs in their droppings. (The eggs are too small to be seen except with a microscope.)
- 2. Young worms (also microscopic in size) hatch from the eggs on the ground.
- 3. In a few days (a longer time in cool weather) the young worms on the ground develop to the infective stage.
  - 4. Young worms in the infective stage crawl up grass blades.
  - 5. Sheep eat the wormy grass.
- 6. The young worms when swallowed grow to maturity in from 2 to 3 weeks and begin producing eggs.
  - 7. In a little while both flock and pasture swarm with worms.

Stomach worms are most prevalent in permanent pastures. They cause weakness, "paper skin," "poverty jaw," scours, and death. A photograph is shown of two sheep, one a wether lamb less than four months old and kept free from worms from birth. Its weight is 81 pounds. The other is a yearling wether that was wormy when a lamb, and it weighs but 65 pounds. By the proper use of the bluestone treatment losses from stomach worms are prevented. Lambs thrive and reach market size at an early age. Ewes under treatment improve in flesh and wool, and produce stronger, healthier lambs, and give more milk than sheep that are wormy.

Directions for giving the bluestone treatment may be obtained from the men demonstrating the treatment, and literature on the subject may be obtained from the Department.

the second secon

A COMPANIA CONTRACTOR AND A CONTRACTOR A

The first of facts and a first that are not recovered by the area of the first and are a first first for the first of the first first of the first first for the first of the first first

en en en la companya de la companya La companya de la co

and the second of the second o

en kan kenaran kenaran di badan dan 1992, beranjan di beranjan kenaran di beranjan kenaran di beranjan beranja Penaran di beranjan di ber

. A CONDENSE OF BROKE CONTROL FOR ENGINEER AND BROKEN DE CONDENSE ABOUT TO A CONDENSE OF A CONDENSE

in the second the control of the con

Springer in a Till Degret of training of training of the formation of the artists of training of the first of the property of the second of the

e for equil to a griff the first to a griff a first and a first printer of a first printer of the first to a control of the first and a fi

### DEPARTMENT OF AGRICULTURE LITERATURE.

There is a Government bulletin on nearly every problem relating to farming, and the Department of Agriculture aims to send publications to persons who will read and use them. The exhibit includes a bulletin rack containing selected literature likely to interest visitors attending a livestock exponition. Attendants will give information regarding Department literature and how to select and obtain it. Following is a selected list of bulletins related closely to subjects treated in the exhibit:

### Farmers' Bulletins:

287. Poultry Management.

614. Saving Labor by Hogging Down Crops.

779. How to Select a Sound Horse.

854. Hog Cholera.

874. Swine Management.

926. Some Common Disinfectants. 931. Soy Beans in the Corn Belt.

1008. Saving Labor by Harvesting with Stock.

1030. The Feeding of Horses. 1055. Country Hides and Skins.

1068. Judging Beef Cattle.

1069. Tuberculosis in Livestock.

1085. Hog Lice and Hog Mange. 1132. Planning the Farmstead.

1134. Castrating and Docking Lambs.

1155. Diseases of Sheep.

1167. Essentials in Animal Breeding.

1172. Slaughtering and Use of Lamb and Mutton.

1175. Better Seed Corn.

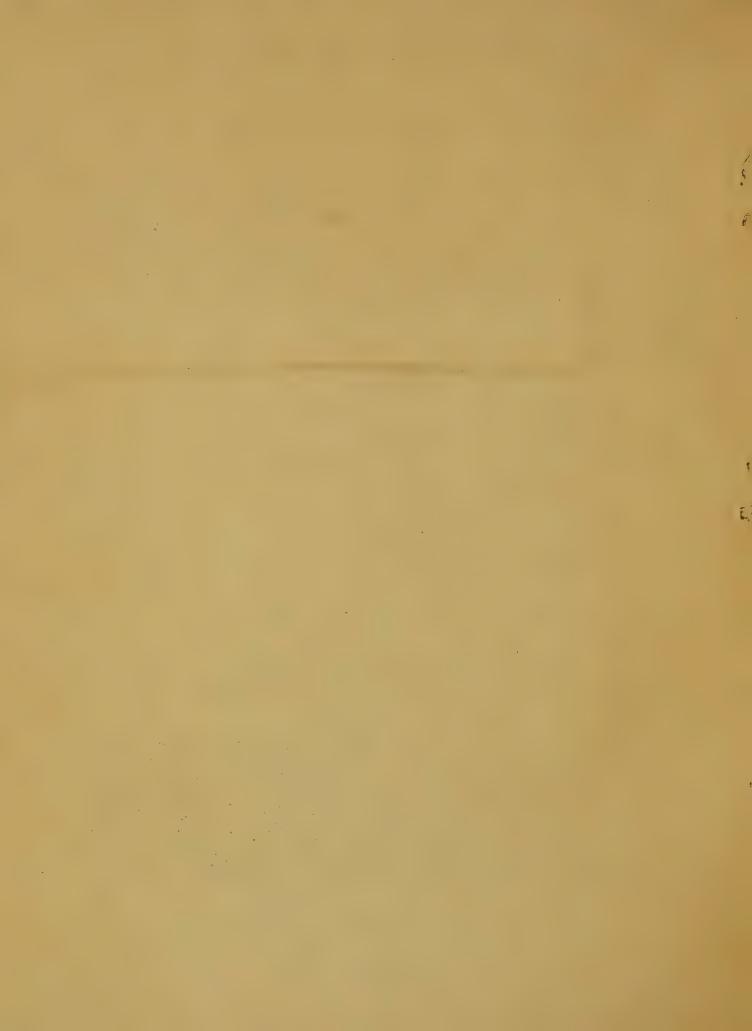
1179. Feeding Cottonseed Products to Livestock.

1183. The Care of Leather.

1186. Pork on the Farm: Killing, Curing, and Canning.

1218. Beef Production in the Corn Belt.

When ordering literature care should be taken to specify as nearly as possible the kind of information desired. It is best first to obtain a list of Department publications and to give the title and number, taking care to specify whether the bulletin desired is a Farmers' Bulletin, Department Bulletin, or Department Circular. If this is not done doubt and delay may be caused in filling the order. Farmers' Bulletins treat general farm problems in a popular style. Department Bulletins give the results of experimental and research work, while Department Circulars contain information of timely interest on special subjects.



### DESCRIPTION OF

## LIVESTOCK EXHIBIT

"THE STORY OF LIVESTOCK FARMING"

The exhibit which is very briefly described on the following pages tells "The Story of Livestock Farming."

The Corn Belt and some adjacent areas have been given special attention because of the well-balanced systems of livestock farming which are practiced in those sections.

Representatives of the Department accompanying the exhibit are ready to explain to visitors the various lines of the Department's work and to discuss livestock matters generally.

"The Story of Livestock Farming."

## "LIVESTOCK FARM ORGANIZATION."

The exhibit entitled "Livestock Farm Organization" is based on a study of one year's business from June 1, 1922, to June 1, 1923, on a 240 acre cattle-feeding and hog-producing farm in Burt County, Nebraska. An enlarged photograph painted in colors shows a view of the farm buildings with the fat steers a few days before they were marketed, and some of the other livestock on this farm.

During the crop year 1922, 130 acres of the 240 acres in this farm were in corn, 43 in oats, 28 in alfalfa, 30 in pasture and 9 acres in farmstead. The livestock kept included 43 steers from September to May; 28 sows which raised 175 pigs; 5 cows, 5 heifers and 7 work horses.

The 43 steers were bought in Omaha in September, 1922, averaging 595 pounds. at \$6.75 per hundredweight, and sold the following May on the same market averaging 1,027 pounds, at \$9.80 per hundredweight. They returned 85 cents a bushel for the corn they ate when corn was worth only 67 cents, besides furnishing a market at fair values for considerable hay and pasture.

The 28 sows produced 175 pigs, 17 of which died during the year. The 44,000 pounds of pork (live weight) raised on this farm was apparently produced very economically although no record was kept of the amounts of feed fed to the hogs.

The following is a summary of the year's business:

THO TOTAL		
Receipts_	Expenses	Income
Hogs\$3,137 Fattening cattle. 2,447 Corn on hand1,497 Miscellaneous372 Total\$7,503	Labor\$922 Repairs and depreciation734 Taxes	and management\$2,113
~ ^	- : - a d d'om orotim n'elle le le le	W

In addition the farm furnished farm-grown products used for the family worth about \$400, and a house that would cost at least \$200 a year if rented.

A study of the year's business from a farm-management standpoint shows the principal reasons why this farm was profitable. It was a fairly large business whether measured in acres, investment or amount of business done. As much corn (the crop best suited to the region) as possible was grown and it was marketed in several ways, through cattle and hogs, or as corn. The livestock enterprises also gave employment during the winter, utilized roughages and conserved fertility. In other words the farm was well balanced. It also had fair crop yields and used labor efficiently. It had very good production of beef and pork, its principal enterprises. A study of the year's business shows that this farm was well managed as it paid the operator \$175 a month for his time above all expenses and 5 percent interest on investment.

# UNITED STATES DEPARTMENT OF AGRICULTURE Livestock Exhibit "The Story of Livestock Farming."

## "MAKING MONEY WITH HOGS."

Some of the important points in successful hog raising are illustrated by a series of pictures and legends thrown upon a screen by a continuous film stereoptican. The screen is located inside a full-sized model of a colonytype hog house. Following are the legends which are used to tell the story:

A good purebred boar is practically a necessity for profit in producing market hogs.

Well-bred sows of good type from strains of known prolificacy must be used.

A gilt should not be bred before she is well developed.

Pasture, or alfalfa hay and protein concentrates should be used with grain during the gestation period.

Clean, dry and well- bedded and ventilated quarters, equipped with a guard rail should be provided for the sow at farrowing time.

Farrowing time is a very critical time. Give every needed attention to the sow and litter.

Sow and pigs should have access to good pasture after farrowing.

Provide a self-feeder in the creep for pigs as soon as they will eat grain.

No class of hogs need pasture more than growing pigs.

For best results, pigs must be kept free from lice, worms and disease.

Using self-feeders for grain and tankage or fish meal is good practice, when sows and pigs are on pasture.

Hogging-down corn with a protein supplement such as tankage, given in self-feeders is satisfactory and profitable method of fattening hogs.

Of the 48,000,000 hogs slaughtered under Federal inspection last year, about 15 per cent of them showed tuberculosis to some extent.

Leading packers are paying 10 cents more per hundredweight on hogs originating in counties free or nearly free from bovine tuberculosis.

Hog cholera, the most destructive hog disease, is preventable by proper methods of sanitation and immunization.

en de la composition La composition de la

# UNITED STATES DEPARTMENT OF AGRICULTURE Livestock Exhibit "The Story of Livestock Farming."

"HORSES FOR POWER."

Horses are the most flexible source of power for farm use, readily lending themselves to the work to be done. A recent test demonstrated that a two-horse team can exert a pull of as high as 21 horse power. It is the common practice to use one, two, three, four, five or six horse hitches in various farm operations, adapting the hitch to meet the power need.

Horse power is characterized by its versatility and adaptability to perform various farm operations. The horse is not limited either by the topography of the ground or by his ability to perform only one farm task economically, for he may be used equally well in plowing, harrowing, cultivating, seeding, haying, threshing, and farm and custom hauling under varying conditions.

The horse is self-replacing, earns its keeps and increases in value up to the marketable age. Farmers may breed enough mares yearly to replace the marketed stock, thus disposing of mature animals at a profitable figure. The young stock raised under this plan continually increase in value from birth to time of disposal and, at the same time, pay their way by performing the farm work.

Where horses are kept, soil fertility is conserved and there is no direct cash outlay for power as the horse consumes home-grown feed.

The farm-labor problem may be partially solved through the production of good horses. Where farmers are dependent upon their families for help, horse production furnishes the element of human interest necessary to keep the youngsters home on the farm.

## Market Classes of Mules.

On the market, mules are classified according to their use, being grouped into five general classes: Draft; farm; sugar; cotton; mining.

The draft class includes the largest mules, standing from 16 to 17-1/2 hands and weighing from 1,200 to 1,600 pounds. They are used primarily for heavy teaming in cities; contract jobs; and lumber camp work.

Farm mules vary greatly in type and quality because the demand for a specific type is not well defined. They range in height from 15-1/2 to 16 hands and in weight from 900 to 1250 pounds.

Animals of the sugar mule class are characterized by ranginess, style and quality. In type, they stand as intermediate between the draft and cotton mule classes. They range in weight from 1,150 to 1,300 pounds and in height from 16 to 17 hands.

The cotton mule is generally lighter, more angular than the sugar or surface mining mule, but heavier than the pit mule. In height, the cotton class varies from 13-1/2 to 15-1/2 hands and in weight from 750 to 1,100 pounds.

Mining mules vary greatly in height and weight depending upon their use. The pit mule of this class weighs about 600 pounds, while the surface type may scale up to 1,350 pounds. The range in height is from 12 to 16 hands.



"The Story of Livestock Farming."

## "BETTER BREEDING AND FEEDING."

This exhibit features the "Better Sires - Better Stock" campaign and the "Better Feeding of Livestock" service of the Department, and seeks to show to those who have not joined these movements the excellent results in livestock improvement that are being accomplished by the use of purebred sires and better feeding methods.

The central attraction of the exhibit shows a livestock farm before and after purebred sires were used. The first picture shows out-of-date buildings and unkempt buildings in keeping with the inferior breeding sires used on that farm. Then, by means of an automatic change of lighting the observer no longer beholds the inferior farm scene which is painted on a screen, but looks beyond it and sees in its stead the same farm after the use of purebreds. Modern breeding methods have brought into use modern buildings and equipment, and the owner of the farm can be seen in the foreground showing some of his animals to prospective buyers. Displayed on the gate-post of this farm is the farm sign, reading "Purebred Sires Exclusively Used on this Farm," which the Department is sending upon request to those who enroll in the "Better Sires - Better Stock" campaign.

Educational posters used in acquainting the public with the purposes of these movements are shown in the exhibit. These include the illustrated poster entitled, "Ten Points in Better Feeding," and others. The Feeding Problem Sheet which brings the better feeding service direct to the farmer or other livestock feeder is shown in its actual size.

As an example of the livestock improvement being made in some sections of the United States, the record of one county that has been active in the "Better Sires - Better Stock" campaign since its beginning, October 1, 1919, is given. This county, Pulaska County, Virginia, shows an increase in numbers of purebred livestock as follows from October 1, 1919, to October 1, 1923:

The figures show a gain of 150 per cent in purebred breeding stock, and 578 farmers in Pulaski County are now using purebred sires exclusively for all classes of livestock.

During the first four years of its progress, the "Better Sires - Better Stock" campaign has enrolled more than 12,000 persons owning 1,500,000 animals and fowls.



# UNITED STATES DEPARTMENT OF AGRICULTURE Livestock fxhibit "The Story of Livestock Farming."

## "FEEDS FOR LIVESTOCK - PASTURES."

This exhibit illustrates the value of pasture as a feed for livestock, and some of the steps necessary to produce good pastures.

A summary of feeding tests shows the value of clover or alfalfa pasture in pork production. In these tests growing pigs were fed corn and tankage both on clover or alfalfa pasture, and in dry lots. Nineteen pigs, on the average, were carried from a weight of 52 pounds to the end of the pasture season. The pigs fed corn and tankage on clover or alfalfa pasture made a daily gain of 1.31 pounds, and required only 370 pounds of corn and 24 pounds of tankage for 100 pounds gain. The pigs in dry lot, although receiving the well-balanced ration of corn and tankage, gained only 1.15 pounds daily and required 410 pounds of corn and 40 pounds of tankage for 100 pounds gain.

On an average an acre of clover or alfalfa pasture saved 1,149 pounds of corn and 468 pounds of tankage, compared with the dry-lot feeding. In addition, 2,326 pounds of hay were cut from each acre of pasture in those tests in which the weights of hay were reported. Further advantages in favor of feeding the pigs on pasture are the more rapid gains of the pigs, and the fertility added to the soil through the growth of legume hay.

Bluegrass is the most important of the cultivated pasture grasses in the United States. The right section of the exhibit shows the important points which must be observed in producing good blue-grass pastures. They are listed as follows:

- 1. Close grazing to keep grass of good quality and prevent weed growth.
- 2. Occasional mowing if necessary to keep down weeds.
- 3. Top dressing with manure or phosphate to increase the growth of grasses.
- 4. Before grazing in the spring, let grass get two inches high.

Good temporary or rotation pastures can be made of: Hay mixtures, sweet clover, alfalfa, soy beans, red clover, small grains and grain stubble.

More detailed information about pasture management or the utilization of pastures by livestock may be secured by writing to the Department for bulletins on the subject.



# UNITED STATES DEPARTMENT OF AGRICULTURE Livestock Exhibit "The Story of Livestock Farming,"

"FEEDS FOR LIVESTOCK - CORN."

This exhibit enumerates some of the practices that must be observed in growing a good corn crop, tells how corn must be fed to get the most out of it, and gives some figures on the uses of corn based upon estimates by the Department.

One of the first considerations in plans for a better corn crop is the seed used and the seed bed in which it is planted. The yield is greatly influenced by the quality of seed that is planted, and if good seed is planted care should be taken to see that the field is well prepared for corn and well cultivated until the corn is mature. Protection from injury by insect pests such as the corn ear worm and the European corn borer, and protection from destruction by rodents such as the 13-lined ground squirrel, often makes the difference between a good corn crop and a poor one. Limited space does not permit giving details of good corn culture in the exhibit, but those who wish detailed information on the subject may obtain it by writing to the Department for bulletins on the subject.

The important point to remember when feeding corn is that it is not a complete and well-balanced feed by itself, and that it should be combined in the ration with feeds containing larger amounts of protein. For cattle, green legumes, legume hay or a protein meal should be added to corn to make the ration well balanced. In a three-year experiment with yearlings and 2-year-old steers in Nebraska, corn and legume hay produced 37 per cent more gain than practically the same amounts of corn and prairie hay. In hog feeding, the value of corn is increased 33 per cent or more by feeding suitable protein feeds such as tankage or skim milk with it.

The right section of the exhibit shows in graphic form the uses made of the corn crop in the United States in an average year. More than 85 per cent is fed to livestock and somewhat less than 10 per cent is used directly for food. The hog is the largest direct consumer of corn; 40 per cent of the total crop is fed to swine on farms. Horses and cattle, it is estimated, account for 20 per cent and 15 per cent, respectively. The next largest use of corn is for human food, 10 per cent of the crop being consumed on farms and ground in merchant flour mills (principally for food). The exports of corn as grain have been almost negligible.

A detailed study of corn crops of the United States is contained in the 1921 Yearbook of the Department.



# UNITED STATES THE ARTMENT OF AGRICULTURE Livestock Exhibit "The Story of Livestock Farming."

"FEEDS FOR LIVESTOCK - SILAGE."

The exhibit on silage enumerates some of the crops that may be used for silage, gives some of the reasons why silage is a good feed for livestock, and cites some feeding experiments in which the value of silage as a feed for livestock has been tested. In addition glass jars, on exhibition, contain samples of silage made from corn, from sorghum and from sunflowers.

The center section of the exhibit gives the results of an experiment conducted by the United States Department of Agriculture and the West Virginia Agricultural Experiment Station to test the value of corn silage for the beef breeding herd. The results showed that corn silage was worth 60 per cent more than shock corn for wintering mature beef cows. An illustration shows some of the animals that were used in these tests.

On the same section of the exhibit are the results obtained by the Illinois Agricultural Experiment Station in an experiment which showed that for growing beef calves an acre of corn silage was worth 30 per cent more than an acre of shock corn.

The right section lists the reasons why silage is a good livestock feed. They are as follows:

Silage creates an appetite for less palatable and cheaper roughages.

Silage is eaten practically without waste.

Silage enables the stockman to keep more animals on the same area of land.

Silage is more palatable than the same crops fed dry.

Silage provides succulence at any desired time of the year.

The left section enumerates the crops that may be successfully used for silage. Corn is the principal crop used for silage, but in regions where sorghums do better than corn, they make excellent silage too. Vetch and oats, sunflowers, sweet clover, alfalfa, and soy beans also have been made into silage with good results.

# UNITED STATES DEPARTMENT OF AGRICULTURE Livestock Exhibit "The Story of Livestock Farming."

"FEEDS FOR LIVESTOCK - HAY."

This exhibit shows how expenditures for freight may be greatly reduced by marketing hay in the form of livestock. According to experiments carried on by several western experiment stations steers weighing 1,000 pounds will consume about 30 pounds of alfalfa hay per head per day. At this rate, 20 steers will consume 45 tons of alfalfa hay in 150 days, when they should be in condition to market. At a certain town in western Nebraska, which may be called Hayville, 443 miles from Omaha, the freight on 45 tons of alfalfa hay in 4 cars is \$283.20, while the freight on 20 steers in one car is \$91.30. This amounts to a saving of \$191.90 or \$4.26 per ton on 45 tons of hay.

On the other hand all hay can not be fed to cattle and other livestock on the farm where it is raised. The demand for hay is so great in cities and on dairy farms on high-priced land that it is more profitable for some farmers to sell hay. However as the distance from market increases it becomes less advantageous to ship hay, which is comparatively cheap in proportion to its weight, Consequently, cattle and other livestock which may be made more valuable by feeding them hay, and which are worth more per pound than hay, are the chief products shipped from the more distant markets, in districts not well adapted to grain production. There is much hay produced where the distance from market is so great that the market price will not pay the expenses of hauling and shipping. Livestock is the only means of marketing such crops to advantage.

Regardless of the distance from market, the feeding of hay to livestock has a great advantage over selling the hay off the farm, on account of our very serious problem of conserving soil fertility. Soil from which hay is continually sold off must be avandoned eventually. That may have been expedient at one tim, but it is no longer practicable as our supply of new land suitable for cultivation is practically exhausted. Keeping livestock and assiduously returning the fertilizing elements to the soil in the form of manure is a practical way at present of keeping our farms productive.



#### "RETTER FEEDING."

This booth urges a study of modern feeding methods to get the best results with livestock. It points out particularly the great advantage to be obtained by the livestock man if he will study in advance his feeding problems and use the right feed at the right time. Such a system saves feed bills and grows better stock.

Not only must the right kind of feeds be fed, but they must be supplied in the correct proportions. The balanced ration is the most economical one. Corn should always be supplemented with protein feeds, even when there is a large corn crop and corn is cheap. Statistics show that cheap-corn years are usually followed by heavy losses of pigs, because insufficient protein feeds have been used by a great many farmers. In hog feeding, the self-feeder and the hay rack are the most economical means of providing sows and growing pigs with sufficient body-building proteins. Plenty of fresh water and lots for the brood sows that provide exercise are as important as proper feed.

Throughout all feeding work, it should be remembered that as young stock makes the most economical use of feed, an effort should be made to get the animal ready for market as quickly as possible.

The best feeding practices can not achieve the best success unless the animals to be grown and fattened are of good quality. When selecting feeders it should be remembered that good quality indicates good feeding ability. Good breeding practice and good feeding practice go together.

An excellent example of the benefits to be derived by the judicious use of the proper feed at the right time is given by the results of investigations by the Department with flushing of ewes to increase the lamb crop. The results of six years' experimental work show that 100 flushed ewes produced 143 lambs, while 100 unflushed ewes produced only 128. The flushing should begin at least two weeks before breeding and continue until conception. Fives should gain at least seven pounds during the flushing period. Fresh grass pastures, soy beans and compeas are excellent flushing feeds. Mixed grain or oats should be used when pastures are dry and fresh foliage is not available.

It is possible to give but a few points on better feeding practices in an exhibit of this nature. Persons desiring assistance with their feeding problems are invited to write to the Department for more detailed information.

### "UTILIZATION OF FEEDS."

In planning feeding operations the livestock feeder often wishes to know how much feed of different kinds is required to fatten a steer or a hog or a sheep, or a carload of either. The booth shows pictorially and graphically the approximate amounts of feed, and successful combinations of feed, that will fatten a carload each of sheep, hogs, and steers. They are as follows:

600 bushels of corn and 17 tens of hay will fatten 250 lambs weighing 55 pounds each, and make them weigh 80 pounds, or one double-deck carload.

450 bushels of corn and 2,750 pounds of tankage or fish meal will fatten 70 hogs averaging 100 pounds, to 200 pounds each, making one carload.

1,100 bushels of corn, 10 tons of alfalfa hay and 5 tons of straw will fatten 20 steers averaging 350 pounds, causing them to gain 325 pounds each in 180 days, making one carload.

The exhibit shows strikingly how livestock concentrate the bulk of farm products and thus greatly reduce the cost of transportation to market.

"Livestock Need Crops--Crops Need Livestock" is the title of a panel on which are set forth some of the benefits of well-balanced farming which involves maximum crop production and the use of crops on the farm by livestock. Such a combination produces an even distribution of labor throughout the year, permits the use of rough lands, saves surplus feeds and feeds that would otherwise go to waste, conserves the fertility of the soil, and reduces the cost of shipping the production of the farm to market, as noted above.

No matter how well-balanced the system of farming may be, however, it can not be successful without good crop yields. Proper crop rotation is necessary to obtain good crop yields. Two good Corn Belt rotations are shown by pictorial diagrams. For regions where winter wheat is grown a good rotation is: Corn; corn and soy beans; oats or soy beans; wheat; clover or sweet clover. For regions where winter wheat is not grown a good rotation is: Corn; corn and soy beans; oats; clover or sweet clover.

All recommendations for feeding and farm management practices must be of a general nature. Each farm presents an individual problem that must be analyzed and solved to fit its special conditions. The Department is always glad to answer questions that will enable the farmer to solve such problems.



#### "CROPS FOR LIVESTOCK."

Corn, clover, oats and soy beans are the crops selected to illustrate the exhibit "Crops for Livestock." They are all successfully grown in the Corn Belt where a large percentage of our livestock is produced.

Corn is the most important crop in the United States, both in acreage and in value. The amount of yield is greatly influenced by the quality of seed that is planted. This is illustrated in the exhibit by pictures of two baskets of corn grown on equal areas. The basket from the area planted with good seed contains more corn and larger, bettershaped ears than the basket containing the corn grown from the poor seed. If the corn is to be fed to hogs, one of the cheapest methods of harvesting it is to turn hogs in the field and let them eat the corn from the stalks -- commonly called "hogging down."

Clovers make excellent feed whether used as pasture, as hay, or as soiling crops. Their high protein content make them valuable feed for growing animals, and a good supplement with corn. One ton of clover hay has a feeding value equal to 1-1/2 tons of timothy hay, 3/4 ton of shelled corn or 2/3 ton of wheat bran for fattening animals.

Oats is the standard grain feed for horses in most sections of the country, and is recognized everywhere as a good growing feed for all young stock. Oats is an easily digested feed and has a high protein content.

Soy beans is another crop that makes good hay and is becoming popular in the Corn Belt as a pasture crop. It can be grown on a wide range of soils, but inoculation is necessary when it is grown for the first time. Soy-bean hay contains a high percentage of protein and is highly palatable. Soy beans are usually grown with corn, when used for silage. Bulletins describing proper methods of handling the abovenamed crops and their use as feed for livestock, can be secured from the Department.

#### 'MEAT PRODUCTION."

The average person seldom stops to consider the important part played by livestock in converting many farm crops and by-products, feeds not suitable for food for man, into edible, concentrated food. The utilization of such feeds as forage crops and by-products of the factory by livestock, is not only one of the fundamentals of economical meat production, but is the basis of a permanent system of agriculture. In addition to such feeds there is usually a large crop of the various grains which can not be consumed by man, and these are most advantageously utilized when converted into meat.

The 1922 corn crop exceeded two and three-quarter billions of bushels, or about 26 bushels for every man, woman and child. No one can eat 26 bushels of corn, but when it has been converted into meat any one can eat the meat that it produces.

The panel entitled "Pasture Helps Fill the Meat Platter" shows cattle, hogs, and sheep on pasture, busy converting grass into meat to add to the Nation's food supply. In the panel entitled "Utilize By-Products Through Feedlot Methods" these three classes of livestock are shown in the feedlot where they may be fed many by-products that would otherwise go to waste.

Meat contains a large amount of proteins, which are body-building substances, in a form easily digested and readily assimilated by the body. It also contains vitamins which are necessary for the normal growth and vitality of the body. Furthermore, meat supplies these food substances in an appetizing and concentrated form. A liberal proportion of meat in the diet tends to make a physically and mentally well-balanced race as well as a well-balanced agriculture.



### "MEAT AND ITS USES."

An education in the selection and preparation of meats can be secured by a careful study of the pictures and text in the exhibit entitled "Meat and Its Uses." The housewife who buys the meat often has no definite idea of the relative value of the different cuts of meat, and in most cases she can not tell a choice piece of meat from an inferior one until she has it on the stove cooking, or until it has been served on the table.

The cheaper chuck steaks from a choice carcass are generally superior to the higher priced porterhouse steaks from a common carcass. Therefore if the person who buys the meat for the family can recognize meat from a choice carcass at a glance, the problem of economical meat for the family will be greatly simplified. Illustrations are shown of cuts of beef and a magnified section of beef both from choice and inferior or common carcasses. Meat from a choice carcass is well marbled (desirable mixing of fat and lean), the fat is firm and white, and the lean has a bright red color; meat from a common carcass shows little or no marbling, the fat is dark and often yellowish, and the lean is a black or purplish red color.

Many people hesitate to purchase meat cut from the fore quarters of a steer, but these cuts are tender and palatable when taken from choice steers that have been properly grown and fattened for market. The greater purchasing power of a dollar is shown to be in the fore-quarter cuts of beef by a series of pictures of cuts of meat. The figures from which this comparison was compiled were reported by the U. S. Department of Labor, and based on average retail prices in 1922 in more than 50 cities of the United States. According to these figures, one dollar will buy 1.8 pounds of porterhouse steak, 2.7 pounds of sirloin steak, 3.1 pounds of round steak, 3.6 pounds of rib roast, 5.1 pounds of chuck roast, and 7.8 pounds of plate beef.

The center panel of this exhibit illustrates methods of preparing meats. A pot roast is shown with potatoes and vegetables, making a well-balanced meal, the meat being prepared in such a way as to preserve all flavors and nutrients. This method of preparing a meal saves both time and fuel. An illustration shows the use of left-over meats and vegetables in making meat salads; and another the making of sandwiches from cold meats which are as nutritious as hot meats.

Bulletins containing useful recipes for the proper preparation of meats may be obtained from the Department.

Section 1997

#### "EQUIPPING A LIVESTOCK FARM."

Good buildings and equipment save feed and labor. This feature in livestock farming, so often overlooked, is emphasized by pictures and brief comments. Drawings and bluepuints of farm homes, cattle barns, horse barns, sheep barns, hog houses, and poultry houses, are shown. Duplicates of these and others of different design may be obtained from the Department of Agriculture.

The panel entitled "Clear pens--Greater gains" pictures a make-shift hoppen which has been thrown together by placing some old fodder and straw on a frame built of fence rails. The type of hog is shown that is usually found living in such quarters. Even well-bred hogs of good quality can not be expected to make the best gains in dark, damp, insanitary houses. Contrasted with this is an illustration of clean and comfortable hoppens provided with dry, clean houses, self-feeders; automatic fountains, shades and wallows. The type of hog that belongs with such equipment is pictured in contrast to the one which shows lack of proper care.

A group of inferior farm buildings with rubbish scattered about the yards, is contrasted with up-to-date buildings. Inferior buildings are wasteful of feed and labor, unsightly, and insanitary, and harbor disease. Careful choice of building sites and good substantial buildings save time, labor and feed, protect the health of livestock and make farm life more attractive.

Consult the Department of Agriculture for plans of buildings that are convenient, durable, economical, and attractive.

#### "WOOL AND WARMTH."

The exhibit "Wool and Warmth" furnishes information of interest to growers, manufacturers, and the public. Wool varies a great deal in fineness, length, strength, and manufacturing value. The selection and breeding of sheep govern in large measure the fineness and to quite an extent the length and spinning quality, while the feeding, care, and health of the sheep are of vital importance in the production of heavy, strong, lofty fleeces useful in the manufacture of warm, durable, and attractive garments, robes, and blankets.

When shearing sheep their fleenes should be dry and the work done on a clean, well-swept floor free from straw, chaff or litter of any kind. The fleece ought to be clipped close to the skin and the shearer should avoid second cuttings of the same wool as fibers of good length are desirable. The next step is to roll and tie the fleece, wrapping the string first at right angles to the direction in which the fleece is rolled and second parallel to the direction in which it is rolled. One wrap each way is sufficient.

The fabrics shown on the center panel illustrate the suitings made from wool of half-blood fineness and overcoating made from wool of coarse grades. It will be noted that half-blood wool of good length is called "combing" wool. This is a trade term which indicates that the wool is of sufficient length to be combed in the manufacturing process. Wool of such length can be made into durable worsted as shown. The short wool from which the woolen suiting is made has the grade term "half-blood clothing." "Half-blood" indicates that the fineness is the same as that of the wool from which the worsted was made, while the word "clothing" indicates that the wool is too short to be combed. Such wool is generally made into woolen or flannel goods, therefore, worsted is more durable and usually more popular than the woolen or flannel goods when the worsted and woolen are of equal weight and the wools from which they are made are of equal fineness, strength, and spinning quality.

On the basis of fineness, prices of wool are quoted by the following grades, which are named in the order of fineness: Fine, half-blood, three-eighths-blood, quarter-blood, low quarter-blood, common, and braid. The word "blood" in connection with wool grade terms has no reference to the breeding of sheep but is used in connection with fractions to designate fineness. Fine and half-blood wool are produced by purebred and high-grade Merinos and Rambouillets; three-eighths-blood and quarter-blood by medium-wool sheep, such as Shropshires, Hampshires and Oxfords; low quarter-blood by the coarsest of medium-wool sheep and grade coarse-wool sheep, and braid by high-grade, or purebred, coarse-wool sheep, such as Cotswold, Lincolns, and Leicesters.

The grade "fine" is the finest and "half-glood" the coarsest of what is commonly called fine wool, that is, half-blood wool is coarser than the finest of Merino or Rambouillet wool, but finer than what we usually call medium wool; "three-eighths-blood" is the finest of medium wool, and "quarter-blood" the coarsest of medium wool; "low quarter-blood" is coarses than half-blood, but the finest of coarse wool, while "braid" is very coarse and "common" is intermediate in fineness between low quarter-blood and oraid.

- 15 -

#### "HORSE PRODUCTION."

There is a need in the United States for production of horses and mules, especially those of better quality. Based upon 1920 census figures, about 200,000 fewer colts were produced in 1919 than were needed to supply replacements on farms alone. About 225,000 high-class animals are needed for annual replacements in cities, making a shortage in replacements of over 400,000 horses and mules in 1919 in the United States.

The surplus and shortage of horses and mules produced on farms is shown geographically on a map of the United States. In the area including the Middle West States of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Iowa, Missouri, Illinois, Indiana, and Ohio are produced most of the work horses and mules for the United States. Although most of our big draft animals needed in the cities and specialized farming areas come from this area, only a small surplus was produced above their own replacement needs in this region in 1919.

In the States of Kentucky and Tennessee where many good mules and light horses are produced, the production was about equal to replacement needs. In the 12 States west of and including Texas, where the horses produced are principally range stock, there was a very small surplus. Yet because most of the stock is undesirable, production may be said to be about equal to replacement needs. On the other hand, the production of horses and mules in the 24 Fastern and Southern States is only one-half that needed for replacements, and both farmers and city trade must look to other sections for replacements.

The Department calls attention to the fact that farmers might profitably produce replacements enough, in connection with general farming, to be able to sell off the older work animals each year. As local market values are determined by the city and eastern trade, it is important that the right kind be produced. The small undeveloped animal of poor quality is a drug on the market. The best brood mares should be bred to purebred sires of the right type, and feeding the youngstar is of parallel importance to proper breeding. Pasture, which is a primary necessity, must be supplemented with grain and hay, and the colt kept growing at all times. Not only is the use of the non-salable roughages of economic importance, but the grain and hay produced in general farming may be profitably marketed through young stock.

As the market demands well-broken and trained horses that will last a long period of years, the colts should be broken at about 3 years of age and used on the farm for a few years. By this system these young horses together with the breeding stock will furnish the power for the average farm, and the young stock will be increasing in sale value. The maximum value of horses is at about 6 years of age and the surplus animals should be sold at this time. The well-bred horse or mule that has been properly fed and well broken is usually salable at a profitable figure, and should increase the income of the general farmer.

### William Bridge

control on a control or a control of the control of

The state of a property of the state of the

In the time of the start of the track of track of the tra

The Jopantonot calls attention to the fact that interpretation of a tenter of the last stability produces registration about a the consecutive section of an ability for an action of the call of the

As the series of pears, the order and trained norses that well had a long test of a series will had a long test of a series of

### "Culling Increases Poultry Profits"

In this exhibit the Department calls attention to culling as a means of increasing egg production. One lot of 22 hens is shown, which was not culled, and which in one year ate 1650 pounds of feed costing \$37.13; the 22 hens laid 175 dozen eggs. Contrasted with this lot is one of 14 hens which were culled, and which laid the same number of eggs, but ate only 1050 pounds of feed at a cost of \$23.63. The lot of 22 hens that was not culled ate 50 per cent more feed than the lot that was culled and produced no more eggs. The extra cost of feed, however, is but one of the larger costs. Others are the extra labor, extra housing room, and extra capital invested.

To enable the poultryman to cull his hens properly, the exhibit gives the points to be looked for when determining a poor layer, or a good layer. These outlines are as follows:

### How to determine a poor layer:

Comb--Shrunken, dull and whitish scales.

Eye--Sunken, dull and listless.

Beak--Deep yellow (on yellow-shanked breeds).

Shank--Deep yellow (on yellow-shanked breeds).

Pelvic bones--Thick, rigid, close together.

Abdomen--Rather hard and shallow from pelvic bones to end of keel.

Vent--Small, puckered, dry.

A poor producer molts early, in July and August.

### How to determine a good layer:

Comb--Full, bright, red, waxy.

Eye--Bright, prominent, alert.

Beak--Pale or white (on yellow-shanked breeds).

Shank--Pale or white (on yellow-shanked breeds).

Pelvic bones--Thin, flexible, wide apart.

Abdomen--Flexible and deep, as measured from end

of keel to pelvic bones.

Vent--Large expanded, moist.

A good producer molts late, in September and October.

Bulletins giving further information on the subject of selecting good layers, and on other subjects relating to poultry management may be secured by writing to the Department of Agriculture.